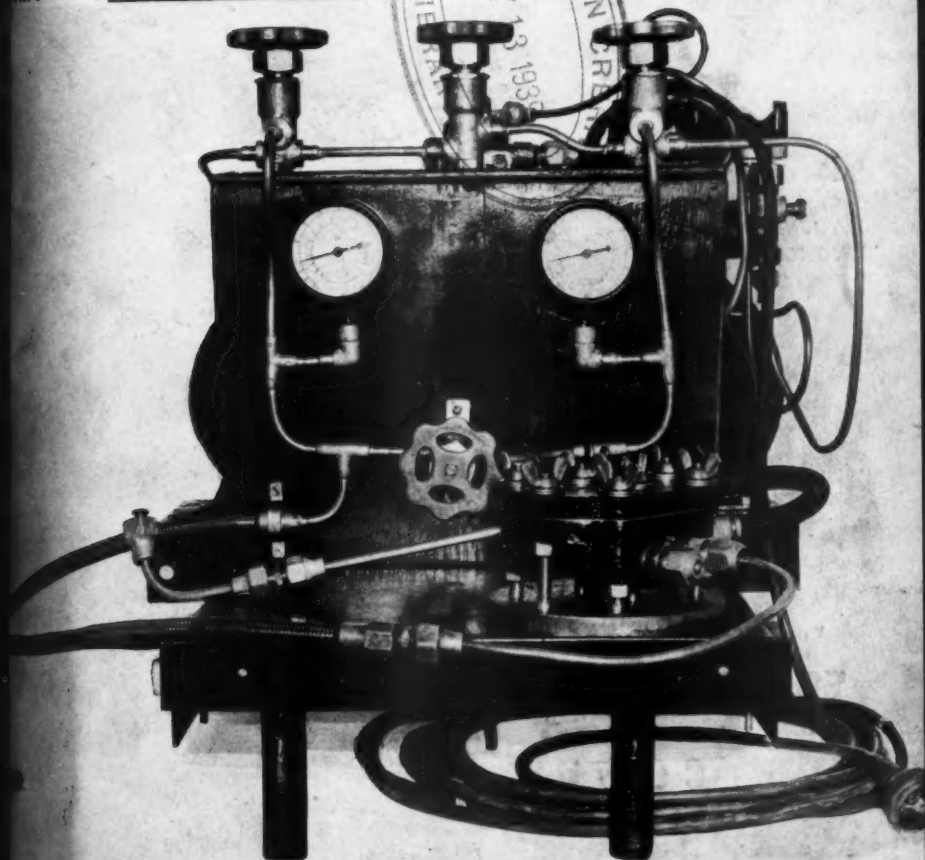


# The Refrigeration Service Engineer

Vol. 7  
No. 5

MAY • 1939



THE SERVICE ENGINEER IN SALES •

SIMPLIFIED AIR CONDITIONING •

SERVICE KINKS • QUESTION BOX •



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lished monthly. Vol. 7, No. 5, May, 1930. Entered as second class matter March 4, 1938. Chicago, Ill., under the Act  
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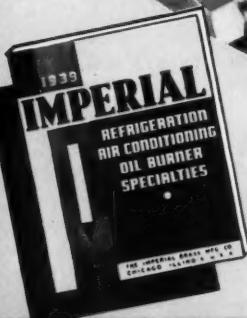


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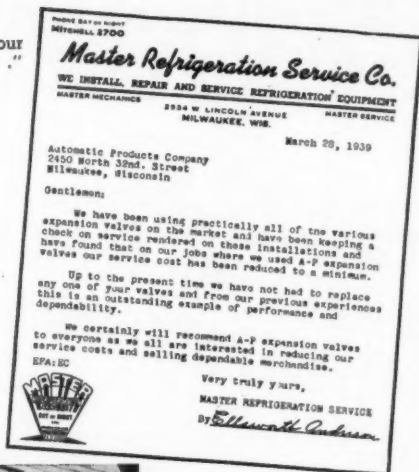
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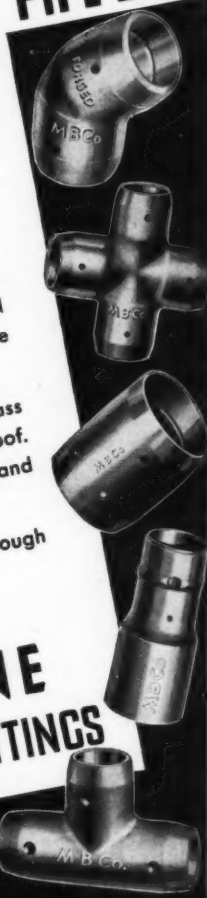
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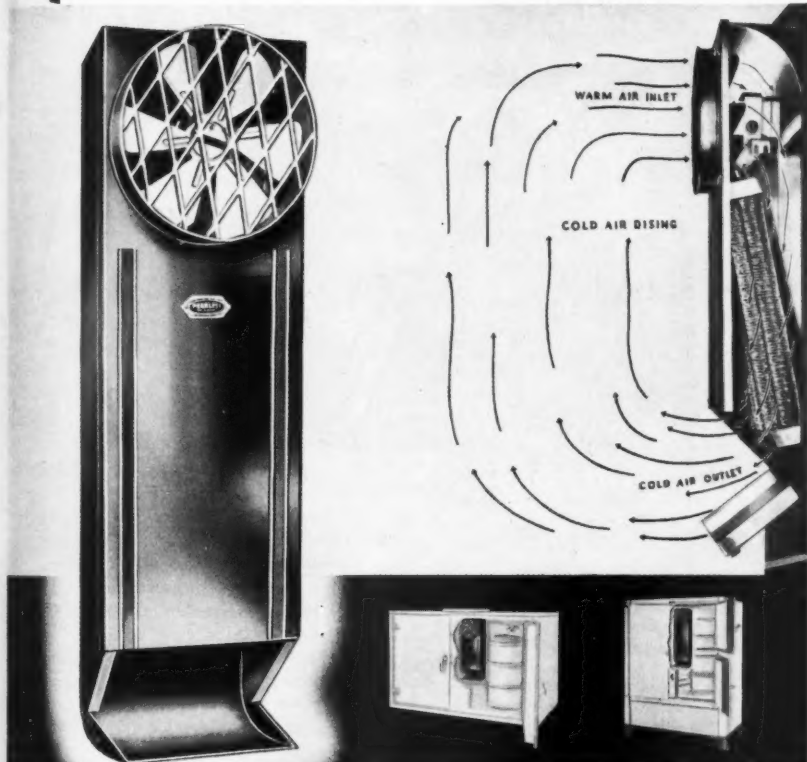
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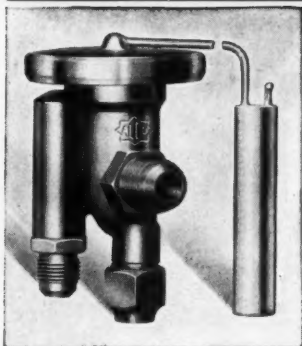
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SERVICE ENGINEER

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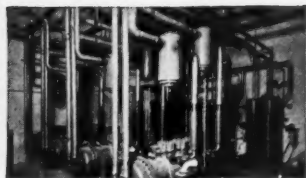
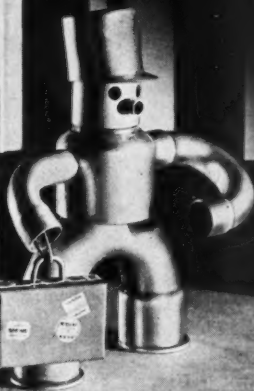
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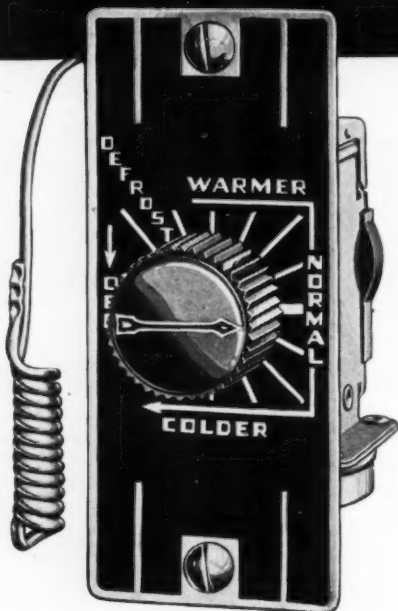
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# The Refrigeration Service Engineer

Vol. 7

No. 5

May 1939

A Monthly Illustrated Journal Devoted to the Interests of the Refrigeration Service Engineer in the Servicing of Domestic and Small Commercial Refrigeration Systems and Oil Burners

Official Organ  
REFRIGERATION SERVICE  
ENGINEERS SOCIETY

## Cover

This month's cover shows a piece of test equipment which can be built by the Service Engineer from material found at hand. An article on page 25 describes in detail its construction and use.

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SERVICE ENGINEER

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# The Refrigeration Service Engineer

Vol. 7, No. 5

CHICAGO, MAY, 1939

\$2.00 per Annum

## The Service Engineer in Sales

The author of this article has had considerable experience as a manufacturers' representative, selling to both small and large organizations. His frank analysis of the weaknesses and strengths of each together with a few suggestions made should prove invaluable to those engaged in sales and service.—Editor.

By BOB TYLER \*

IN the smaller commercial equipment, service is predominantly important, because it demands very careful installation and because it demands very careful and efficient service after installation.

Despite every effort to change the situation, the bulk of the installation of commercial equipment in the country today remains the remote type. Many companies are driving very hard in the direction of package units, but as yet the remote installation is most popular. This type of installation has in the past, and always will, fallen directly in the hands of the service engineer.

The smaller organization has a very definite advantage in commercial sales. The reason is that in the larger organizations that have large territories to cover, glaring weaknesses are presented in the sale of commercials. Those weaknesses are:

First: A small volume of sales for a large company. This is possibly due to the fact that while commercial sales do not represent a large volume business and do not begin to approach the volume of domestic sales, still it seems to have fallen into the hands of the domestic distributor.

Second: There is great difficulty in properly coordinating the sales and service in the commercial departments of large companies. They are too often broken down separately and do not function as a unit.

Third: The larger organization too often has an appeal to the weaker salesmen because of its prestige. The larger organization frequently gets men who are expecting, and receive, drawing accounts which it is impossible for them to earn, but, because of the wide multiplicity of items which they have, they are able to at least get by.

In the final analysis, the only strengths that lie in the very large distributing organization are its prestige and its ability to get better coverage of its territory, par-

\* Tyler Fixture Corp., Niles, Mich. Address delivered before the January meeting of the Illinois State Association R.S.E.S.

ticularly from a sales promotional standpoint. It seems to have a better unified program, possibly due to the ability to spend more time for specialization on the problems of sales promotion.

Some of the larger organizations also have a better check-up or follow-up after installations are made, both on sales and service, and these are the points that the small organization must lick.

Among the weaknesses that are apparent in the average small organization is too much use of unknown lines. There is a quick appeal to some lines of merchandise that are offered to smaller organizations and, too frequently, because of their ease in obtaining the line, they are only too willing to go along, with very disastrous results.

#### Over-Accenting of Price

Then, there is that very basic weakness of over-accenting the price factor on the part of the small commercial organization, presumably because of a lack of time to properly diagnose the sales promotional information that is put in their hands and to see actually what powerhouses they have in this information. Price seems to have become the cry of the average small commercial organization.

There is a lack of trust—something that can be easily remedied by years of experience. There is weak advertising and very weak follow-up. These are things which are very definitely serious factors in commercial sales. Their strengths, however, outweigh these weaknesses.

There is direct personal supervision, by one man usually, of sales and service—a factor rarely found in large companies, and a very important factor in the successful operation of a commercial department.

There is a more personal tie-up between the salesman and the service man, and the salesman and the manager, and, as yet, there isn't anything that beats interest in the employee's activities.

There is a greater concentration of sales, resulting in the loss of fewer sales to competitors. When you are small, you don't shrug your shoulders and say, "Well, I will get the next one," because you realize that this statement is a fallacy, as it always is.

There is a development of loyalty found in the smaller organization that no larger organization can ever hope to enjoy. It is true that among larger companies you do find loyalty, but all too often it rests in a small clique within the company.

The following paragraphs contain a few things which are necessary to remember in the creation of a good merchandising program by a service organization which is going into the sale of commercials for the first time, or is revising its set-up. Some of these things may seem rather minute, but putting into operation the points listed will result in a pretty unified and smooth functioning commercial department.

The first point is in the lines of merchandise which you handle. If possible, get a nationally-known line. The promotional help that is given by the larger manufacturer is of intense value if properly utilized by the service organization going into commercials. This factor cannot be over-emphasized.

The second point is to maintain a display and display room, even though the size of the display may be small. Maintaining a display and display room is a very important factor. On the basis of merchandise sold directly from it, displays mean very little, but you will find that, invariably, the organization that maintains a good, neat display, regardless of its size, does a good business over a period of years. It is a very important point. It may handicap you, that \$150.00, \$250.00, \$500.00 or \$600.00, at the time you go into it, but it is the only way.

#### Get Good Office Help

The third point is to get good office help, and preferably a girl. A number of rather successful service organizations whose apparent weaknesses in the handling of 'phone leads or 'phone calls from the outside on service calls have shown this point to be responsible for a very serious business loss.

The fourth point is: Write letters and write out submissions for every single proposal that you make, no matter how small. Some of these things take a little time, but stenographic help is inexpensive and the time the girl takes to type that letter will give you, over a period of years, the reputation of being a thorough merchandising engineer, which is what you want.

The fifth point: Even though you do it very slowly, complete a survey of your entire territory. The survey should cover not only new merchandise, but the equipment which is already installed. It will help you in your service business to get a list of all the equipment installed. Get a list of your new prospects, survey your territory and know your merchants. It will increase your



service sales and will give you a true picture of your territory. Few organizations have a good picture in their minds of just what is happening within a radius of ten or fifteen miles of their offices, because they listen to gossip rather than going out and finding out for themselves.

The sixth point: Hire salesmen on small drawing accounts and feel free to let them go if they fail. This is a tough point, but a lot of organizations have fired men, and you may have to. You may hesitate a long time before you can bring yourself to the point of firing them, probably because of the fact that you have worked shoulder to shoulder with them and lived next door to them. But don't overlook the fact that there may be a better job waiting in the next county for the fellow you let go, and always bear in mind that when you let a man go who has failed, you are doing him as much of a service as you are doing yourself.

#### Use Other Installations for New Sales

Seventh: Follow up every sale with personal calls and use these sales in making new deals. It is doubtful whether the manufacturers' volume of sales, on a national basis, would have been as large had it not been for the national accounts of the chain type. In watching the development of the independent volume, it has been surprising to note how it has paralleled the extension of the chain volume. Use those installations. Distributors and dealers are urged to use the installations of commercial equipment that are found in chain food stores all over the United States; it is probable they have been responsible for the sale of thousands and thousands of dollars worth of merchandise. Many times we forget this point. You forget that that splendid installation in the neighborhood is the finest talking point you have to offer your prospect.

Eighth: Pay your service men bonuses for leads that are sold. It is becoming more or less the general trade practice, and it is a good practice unless it is overdone.

Ninth: Install a good cost system and a good checking system.

The tenth point is: Use every available promotional service of your suppliers; and this is a point that is all too often neglected. Use those fellows who come out to see you from your source of supply. Take them out with you and make them work. But never make the opposite mistake of depend-

ing upon your source of supply for the bulk of your sales, because there is no quicker way in the world to alienate a manufacturer than to fall back and be dependent upon him for your sales efforts.

The eleventh point, a personal one, is very valuable. It is simply this: Dress up when you go out on a sales call. As a service engineer, you have your service work to do and your sales work to do, but, divide your work as you can and dress for the type of work you are doing.

The twelfth point is to use your knowledge of machine installation and service to talk technically wherever your buyer is interested in talking technically. Men are gadget-minded, and as proof, watch them buy an automobile, a refrigerator—watch them buy anything. They are interested in talking to the fellow who knows. Here is one definite advantage you have over the average salesman. You know what the cycle of refrigeration is, and many of them do not. I think there is a time to air your technical knowledge, a time to let them know that you are an expert. There is no better way in the world of selling merchandise than to be an expert. There is no better way of creating an impression upon any merchant, upon anyone, in fact, than the definite knowledge that you are an expert and have the ability to put over that knowledge as an expert. Let your customer and your prospect know that you can talk technically concerning your own business—but don't overdo it, as is so often done.

#### Observe Your Competitor's Line

The thirteenth point is: Gather and obtain all the information possible on competitive lines of merchandise. Sometimes that is difficult to do, but you can do it if you make a practice of visiting your competitors' jobs. It is particularly easy for service organizations because of the number of calls they receive to work on competitive equipment. Learn its weaknesses; learn its strengths; but at least be competent to talk about the advantages of your product over the other man's.

Fourteenth: Observe your competitor's technique in selling. This is particularly true of merchandise of a specialty nature, merchandise of the commercial refrigeration type. In the industry, we have hundreds of remarkably skillful specialty salesmen, men whose incomes have been in brackets that would amaze the average person, who have,

over a period of years, developed a selling technique on a commercial refrigerator to the point where it is almost an exact science—until they can almost tell you after the first ten minutes whether they are going to make the sale or not, and how much they can get for it if they do make it. There are many things we don't know about the selling technique of a good specialty salesman, but in your territory somewhere there is a top grade specialty salesman selling equipment of a type similar to yours. This is a science and you can learn a great deal from observing your competitor's technique. Watch your competition and your individual competitor, and learn from his selling technique.

### Avoid the Big Jobs

The fifteenth point, and I think the most important one of all, is avoiding the sale of a promotional type. Though the sale of a 150-foot super-market job is attractive from a dollar volume standpoint, there are probably twenty-seven competitors all struggling to get it, and unless you have a pull somewhere, those are the deals that will break you; they are the deals that nobody makes much out of. Walk around the corner into the little neighborhood grocery store and sell him a 6-foot case, but watch out for the big ones. They are nice if you can get them, but never attempt to break yourself by getting them. Your first duty in the sale is to make a profit. Sometimes this fact is forgotten in the heat of competition. Furthermore, your first duty to yourself is to avoid the manufacturer who insists upon your sale of his merchandise regardless of your profit set-up, because there is very little glory in this business. You owe yourself that profit, and if you cannot make it with the line of merchandise you are handling, you had better get another line or go out of the business entirely.

This alone is probably the most serious weakness of the service organization going into sales, the lack of a profit out of sales. You say, "Well, service will take care of me, anyway. It is my bread and butter." If you are going to go into sales, you will soon find you are going to have the problems of sales, and they are many. You are going to have your hold-backs on your long-term contracts; you are going to have your commissions; you are going to have so many problems suddenly creep up on you that you will begin to realize that the sale you made twelve months ago, on which you made

\$30.00 when you should have made \$130.00, is the thing that is going to wreck you in this business.

This weakness, of interest in sales volume rather than profit, is perhaps the greatest weakness of the small service organization or the large service organization today in the sales field.

To sum up, the greatest handicap the small organization has, in comparison to the large organization, is the lack of prestige. To offset that, however, the small organization can make its sales appeal so technically perfect and correct that its superiority must be recognized. We can assume you have a good line of merchandise and that the supplier is giving you good promotional information. You can make a written submission and presentation on the job that is essentially so high-grade that your prospect cannot fail to recognize the fact that you know your business. Five dollars or so spent on the preparation, even to the extent of sending out for drawings and blueprints, etc., is important enough as a prestige builder alone to warrant the expense, even if you do lose the job. We all like high-grade workmanship and we all like expert advice. Be an expert and use your knowledge.

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### CLEANING BRASS

ONE part common nitric acid and one-half part sulphuric acid mixed in a stone jar will do a very good job of cleaning brass parts. When using, have another jar of fresh water and a box of sawdust near together.

Dip the articles in the acid, then into the water and finally rub them in the sawdust. They should come out with their natural brass color.

If the brass is greasy, it will be necessary to dip it in a strong solution of potash and soda first, then rinsed to remove the grease. The acid will not clean a greasy surface.

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Frank Rock  
Missouri

I am a new reader of your excellent publication, and am well pleased. In my present status as a student, I find the articles, based on experience in the field, worthy of careful comparison with, and contrast to, the theory of the classroom.

## Second Article

# Simplified Air Conditioning

By GEO. G. BORDEN

IN last month's article our discussion showed the human body functions much like an ordinary furnace and like any good furnace, the human body generates much more heat than is required for average conditions. A good furnace will generate sufficient heat to maintain comfortable conditions in a space on sub zero days; so too, the human body generates much more heat than is required under normal temperature conditions. Because the human body generates more heat than is required to sustain life, it must continuously throw off heat in order to keep from burning up. We learned also that the body throws off heat by three distinct methods: radiation, convection and evaporation.

In air conditioning work it is necessary that we provide air conditions which will allow the body to lose heat at the proper rate. If the air is too cold, or is moving too quickly or is too dry, the body will lose heat too fast and discomfort will result. On the other hand, if the air is too warm, is still and is too moist, the body will be uncomfortable warm.

The next step in our discussion will be a discussion of air and what we can do to it to make it comfortable for human habitation.

### What Air Is

Air is a mixture of gases. This mixture is made up primarily of two gases—nitrogen and oxygen. Air also contains small amounts of other gases such as carbon dioxide and a small amount of water vapor. In a little while we'll learn that one of our primary jobs in air conditioning is to control the amount of water vapor in the air.

### The Eight Phases of Air Conditioning

Before we study water vapor however, let's learn a little about the Eight Phases of Air Conditioning.

A complete year 'round air conditioning system should provide eight phases of air

conditioning. These eight phases might be enumerated as follows:

1. *Ventilation*—the act of continually bringing fresh air into the space.
2. *Air Cleaning*—the act of removing objectionable dust and dirt from the air brought in and from air in the space.
3. *Air Circulation*—the act of keeping the air in a space in constant, draftless motion.
4. *Noise Elimination*—the act of keeping outside noises out of the conditioned space.
5. *Heating*—the act of raising the temperature of the air in the space in winter.
6. *Humidification*—the act of adding moisture to air to prevent over-dryness in winter.
7. *Cooling*—the act of removing heat from the air in summer.
8. *Dehumidification*—the act of removing moisture from the air in summer.

Now let's consider each of these phases in succession to find out why they are necessary and how each is accomplished in our air conditioning system.

### Ventilation

Ventilation is the act of continuously bringing fresh air into the conditioned space. Ventilation is an essential phase of comfort and health air conditioning because life itself depends upon air. Have you ever considered the fact that a normal healthy man can live for days without water, for weeks without food whereas he can live only *minutes* without air? Did you know that the average man consumes three pounds of food each day, four pounds of water but over 30 pounds of air?

From this simple fact you can see that air is an absolute essential to life itself and a person's well being depends to a certain extent upon the air he breathes.

In the process of life, the human body breathes both through its lungs and through

its pores. And in this process of breathing, poisonous waste materials are given off that often have a very disagreeable odor. In order to keep the air fresh and alive, it is necessary to continually remove this stale, used air from the room. This is done by ventilation—by bringing fresh clean air into the space continually. One of the best tests of good ventilation is the odor of the room air as you pass from fresh outdoor air into the room. If a perceptible odor is noticed, the room is poorly ventilated. In a poorly ventilated room people become drowsy and uncomfortable.

### Air Cleaning

Air cleaning is the process of removing dust and dirt from the air brought into a space. Air cleaning is generally accomplished by means of filters. These filters are made of various materials and are available in two general types—the throw-away type and the washable type. The throw-away type must be discarded once it becomes dirty whereas the cleanable type can be washed in water or shaken to remove the dust and dirt.

The most popular type of filter used in the package type of equipment is the throw-away type. This filter is made up of one of several materials such as glass wool, steel wool, bronze wool, oiled cardboard, animal hair. Generally these materials are coated with a sticky substance to catch the dust and dirt as it passes through the material.

Sometimes the glass wool and bronze wool filters can be taken out and cleaned but generally on small units, the filters are not meant to be cleaned.

### Air Circulation

Air circulation is the act of keeping the air in a space in continuous motion and it is one of the essential phases of air conditioning. In still air, the human body soon becomes surrounded by an envelope of air which acts as an insulator and prevents the body from throwing off heat. Hence, still air prevents the body from breathing through its pores and this causes a feeling of suffocation. As we learned in last month's article, fast air motion can cause a cooling effect on a hot day because it helps to throw off body heat rapidly. Too much air motion is called a draft and our problem in air conditioning is to provide the correct amount of air motion to allow the body to lose heat properly but without creating drafts.

### Noise Elimination

Noise elimination in air conditioning systems has to do with keeping outside noises out of the conditioned space. In a properly conditioned space, windows and doors can be closed because ventilation is obtained through the air conditioning unit.

The intake air chambers to many units are sound insulated to prevent outside noises entering through the fresh air intake.

As far as the machines themselves are concerned, most manufacturers line the interior of the cabinets with heavy sound deadening material so that the machines operate very quietly.

### Heating

In winter time our problem in air conditioning is to provide conditions which will allow the body to cool itself at a comfortable rate. Because outside temperatures in winter are so low that the body loses heat too fast, it is necessary to heat the inside of the space to a temperature higher than outdoor temperature. Because of this temperature difference, heat continuously flows from the conditioned space to the out-of-doors so that heat has to be continuously added to the space.

The heating phase of air conditioning can generally be added to self-contained units by placing a copper fin heating coil inside the unit and connecting this heating coil to an existing steam or hot water line.

Sometimes the heat supplied is not enough to heat all the air that passes through the conditioner to make up for heat loss from the conditioned space through walls, windows, etc., or perhaps the heating coil has only sufficient capacity to raise the temperature of the ventilation air from outside temperature to room temperature. Under these conditions, the coil is called a tempering coil rather than a heating coil. And its purpose is to prevent cold drafts due to the cold outside air brought into the space.

### Humidification

In winter time, air indoors is too dry for comfort and health. Often times the air in the average home in winter time is drier than air over the Sahara Desert. As a result, in winter time, this dry air takes so much moisture from a person's nose and throat that these parts of his system feel parched and dried out. This means that the nose and throat can no longer filter the air

breathed properly and this often leads to colds and respiratory troubles.

Also in very dry air, the skin gives off too much moisture. The evaporation of this large quantity of moisture causes a cooling effect so that a person cannot be comfortable in a 70-degree room and it is then necessary to raise the temperature in the room to above 70 degrees to offset the large amount of body heat loss due to evaporation. The higher the inside temperature is maintained, the greater the heat loss will be from the space.

Spray humidifier assemblies can often be added to self-contained units to add moisture to the room air in winter. The spray humidifier assembly generally consists of a solenoid valve to start and stop the flow of water to one or more spray nozzles. The water leaves the spray nozzles in the form of a fine mist which is picked up by the air stream and carried to all parts of the room.

The temperature of the air in summer is so high that the body can't lose heat fast

enough to feel comfortable and hence in summer it is our problem to remove heat from the air. This we do in self-contained equipment by passing air over a cold coil. As the warm air contacts the cold coil, heat flows from the air to the coil and so the air becomes cooled. Now as we pass this cooled air over the human body, the body can throw off heat fast enough to remain comfortable.

#### Dehumidification

In summer, air generally holds too much moisture for comfort. As a result of this moisture in the air, the human body can't throw off perspiration fast enough and this causes a person to feel sticky and uncomfortable. If the air is cooled without removing some of this excess moisture, the air in the space will feel cool but it will also be damp and uncomfortable. Thus in summer it is our problem to remove excessive moisture from the air so that the body can throw off a sufficient amount of moisture to be comfortable.

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## Refrigerated Trucks Save Perishable Foodstuffs

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EVER since the first trucks and trailers started rolling down the highways in inter-city and inter-state hauling, there has been the problem of proper refrigeration to maintain the perfection of perishable foodstuffs during long hours in transit.

A great deal of thought has been given to developing systems for using both water ice and dry ice. Up to the present time mechanical refrigeration has been thought too expensive to install and difficult to maintain.

Yet this system has had a wide application in the ice cream industry, which has many mechanical refrigerating systems in operation. Neither wet ice nor dry ice have been found economical enough for the low temperatures necessary for holding ice cream. The present practice in the ice cream industry on all trucks that return to

their home base every night is to install what is known as holdover plates, in the trucks, which are refrigerated by a compressor permanently located at the plant or garage. Where trucks do not return to home base, practice has been to install a compressor in the truck that can be plugged into an electric outlet wherever the truck is garaged for the night. Holdover plates are refrigerated from this individual compressor.

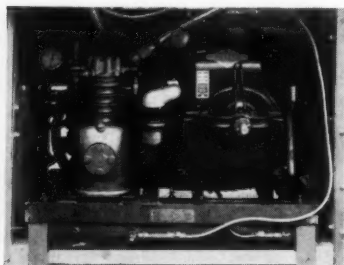
From the experience gained in furnishing refrigeration for the ice cream industry, a new mechanical refrigeration system has been developed for inter-city trailer hauling. This is comprised of a small air-cooled gasoline engine driving a compressor by means of V-belts. Compressor is connected to holdover plates mounted in the ceiling of the truck which provides refrigeration in the





The type of truck used in transporting perishable foods. The condensing unit is enclosed in the box on the side of the trailer

body. In addition to compressor connected with the holdover plates, a dial thermometer is mounted on the front of the trailer so as to indicate inside temperature. Driver can read it through a window in back of cab. No automatic controls. The gasoline engine is set to a constant speed recommended by the manufacturer; pulley arrangement is worked out so that gasoline engine drives compressor at correct speed.



The Mills condensing unit used to refrigerate the trailer

When refrigeration is required in the trailer, gasoline engine is started and remains running until driver stops it. He is responsible for maintaining proper temperature in the trailer. This system eliminates maintenance due to servicing automatic control features. This is the simplest system devised and the cheapest to operate. Has a capacity of approximately 6000 B.t.u.'s per hour, enough to keep a temperature as low as 28 degrees F. in 95 degrees outside temperatures, in commercially insu-

lated trailers having two inches to three inches of insulation, as furnished today by the large manufacturers.

Trailers for handling quick frozen foods are coming more and more into demand. Such foods require near zero for successful handling. This range of temperature can be accomplished with the same refrigerating unit if the insulation of the trailer is increased to approximately six inches. To maintain approximately zero in commercially insulated trailers having only two to three inches insulation, a refrigerating unit with about twice the capacity of the one herein described will be necessary. It would seem better to obtain low temperature by adding insulation rather than increasing refrigeration equipment.

Cost of maintaining this temperature over a 10-hour haul is about 60 cents. Cost of entire equipment installed about \$600 in a 20 foot or 22 foot trailer. This system may be slightly higher to install than wet or dry ice, but it is the most economical to operate and can achieve constancy not within the range of either of these two.

Amount of holdover solution in holdover plates is such as to give equivalent of four hours of compressor operation. In other words, should anything happen to the mechanical operation of either the compressor or the gasoline engine it would be four hours before the temperature inside the body would vary enough to cause any anxiety over the load. In this time the driver would be able to locate a serviceman to restore its operation.

The first of the trailers equipped with this



new system was put into operation on a run to Fort Wayne, Indiana, from Chicago. On several test runs the cost of the operation was so low and the results so satisfactory that the trailer has been used on longer runs to Cleveland and other Ohio points, handling fresh meats for one of Chicago's large

packers. The fine condition of the product at the delivery point has become an outstanding feature and desirable to the packer.

The system was developed in collaboration with Mills Novelty Co., whose one h.p. air-cooled condensing unit was used to supply the refrigeration needed.

# Constructing Refrigerated Rooms

By WILLIS M. REES\*

THE past few years have seen some very great changes in the design and construction of refrigerated rooms. These changes have in most cases meant considerable reduction in their cost and a greater assurance against the accumulation of ice or water within the construction.

The methods applied to cold room construction today make use of principles of moisture behavior which have long been known to the refrigeration engineer. It is the behavior of moisture in moving from warm to cold areas. The refrigeration engineer sees evidence of this in his everyday experience. Even the housewife sees it in her electric refrigerator. She knows that foods must be covered to prevent them from drying.

Cold air, being dry air due to its inability to hold moisture, thirsts for moisture and draws it from every source it can. In the electric refrigerator, the cooling coils collect and freeze the moisture from the air around them. This in turn dries the air in the entire cabinet which draws moisture from uncovered foods.

The refrigeration engineer has great concern for the construction of the rooms in which his refrigerating equipment is installed for three main reasons:

1. It must have low heat transmission so that the refrigerating equipment will be economical to operate. All heat passing into the cold room from the warmer exterior areas must be absorbed by the refrigerating equipment so the desired temperatures can be maintained.

2. The room must be so constructed that it efficiently prevents the leakage of water vapor through walls, floors and ceilings into the cooled area, as moisture brings heat with it that must be absorbed. Excess moisture leaking into the room to be cooled means larger refrigerating equipment to handle the excess load the moisture necessitates. The boundaries of a room may be efficient in excluding conducted heat, but may still readily permit moisture to enter through them. A properly designed room should efficiently retard the in-leakage of moisture as well as conducted heat.

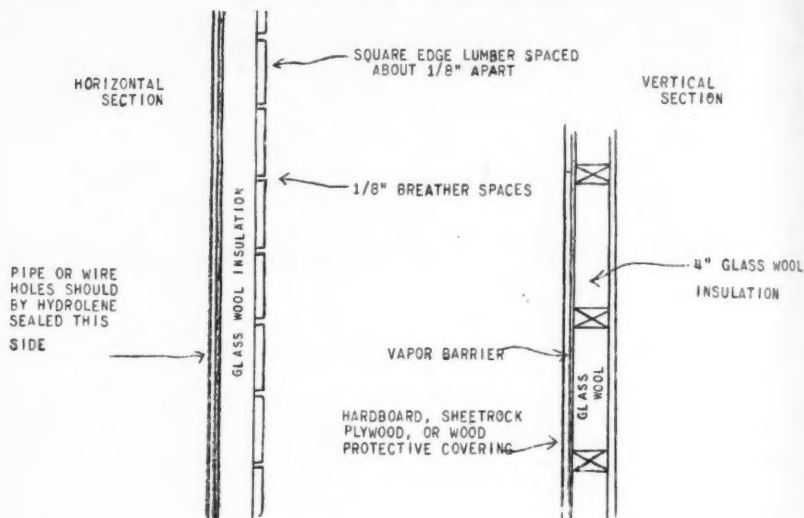
3. The construction of the room should be such that the walls, floors and ceilings do not accumulate water or ice which increases the conductivity of heat into the room. The refrigeration engineer as well as his customer wants assurance that the equipment will continue to operate as efficiently over a long period of time as it does when first installed.

## Airproof and Vaporproof Insulation

The principle of construction that should be applied to meet the above requirements can be stated very simply: Vaporproof the warm side, and let the cold side breathe "to the colder air." Most materials of construction, even though air-tight may be porous to the movement of water vapor and will "breathe." However, this very fact makes necessary the careful consideration of the materials to be used on the warm side of a wall, floor or ceiling as they must be both airproof and vaporproof. For reasons of

\*Insulation Engineer, U. S. Gypsum Co., Chicago, Ill. Presented before the Illinois State Association R.S.E.S. meeting January 18, 1939.

## WALL & CEILING CONSTRUCTION



## FLOOR CONSTRUCTION

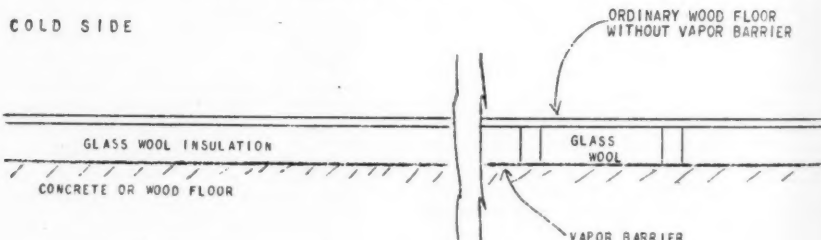


Fig. 1.—Showing the type of construction most suitable for use in cold storage rooms

economy, ready availability of materials, and simplicity of applying the correct method of construction, a frame construction using fill types of insulation is suggested.

The dimensions of the framing members are determined by their structural requirements and the thickness of insulation needed. For most rooms with temperatures of 80 degrees F. or higher 2x4 framing members are satisfactory, as they meet the structural requirements and permit the use of

about a 4 inch thickness of insulation between them.

The following or similar materials are known to be good vapor barriers and should be used on the warm side of the structural members:

1. Light weight asphalt roll roofing.
2. Asphalt impregnated and surface coated sheathing paper, glossy surface, weighing 35 to 50 pounds per roll of 500 sq. ft.
3. Laminated paper made of two or more

sheets of kraft paper cemented together with asphalt, 30-60-30 grade.

#### 4. Aluminum foil mounted on paper.

If a building paper is to be used on the cold side of a construction it should be vapor porous, such as roofing or slaters felt or the common papers.

When constructing a wood frame cold room, the warm sides of the framework should be covered with one of the above named vapor barriers covered with some type of boarding to protect it against damage. The space between the framing members should be filled with insulation. The cold side face of the walls, ceilings or floors can be any standard construction which is vapor porous. For most uses, wood is recommended, as it permits the ready attachment of wiring, pipe lines, hangers, etc. For walls and ceilings square edge lumber is suggested with about a  $\frac{1}{8}$  inch space between each board.

#### Advantages of This Construction

The above construction complies with requirements in that:

1. It permits adequate control of heat conductivity of the construction as efficient insulation can be used in required thicknesses.
2. The use of an adequate vapor barrier on the warm side of the construction is effective in stopping air leakage in or out of the room and preventing the entrance of moisture into the room.
3. With a vapor barrier on the warm side of the construction moisture is effectively kept out of the insulation and the vapor porous construction on the cold side permits a continuous dehydration of the insulation, giving the best assurance possible that the insulation will continue to function at maximum efficiency.

The insulation material should meet the following requirements:

- Have high heat insulating efficiency.
- Be low in cost.
- Be readily available.
- Be fireproof.
- Should not absorb nor give off odors.
- Should not be attractive to rodents or vermin.
- Should not absorb nor retain dampness.
- Should not be affected by moisture.
- Should be in a form easily and economically installed.

There are many uses for cold rooms and the list is growing every day. Following

is a short list of a few markets for refrigerating equipment and cold rooms:

- Tavern beer coolers.
- Food storage rooms (meat, fruit, vegetables, dairy products.)
- Bakery dough retarding rooms and yeast storage.
- Floral shop cut flowers storage rooms.
- Fur storages.
- Storage of biological products (pharmaceuticals).
- Cold storage warehouses.
- Cold storage locker plants.
- Refrigerated farm fruit and vegetable storages.

*Remember*—Use an efficient water vapor barrier on the warm side of a cold room construction and let the cold side breathe to the cold air. Many years of actual experience and thousands of dollars worth of research have shown this to be the correct method permitting the lowest cost construction. This is of considerable importance to the refrigerating engineer as it makes his job of selling easier by lowering the cost of the completed installation, and yet maintaining a high standard of efficiency and performance.

Fig. 1 is a drawing showing suggested construction details using the correct principles of moisture control.

§ § §

J. W. Parker  
Texas

I have been reading your fine publication for about four years, and must say it has been one of my very best "investments."

M. D. Thiebout  
Michigan

Enclosed please find \$2.00 for renewal for R. S. E. I am very sorry for being so late on my renewal. It is a very fine magazine and should be supported by all men connected with refrigeration.

L. Schroeter  
New York

May we take this opportunity to thank you for making possible a publication of such interest and help as THE REFRIGERATION SERVICE ENGINEER. Your article in the January issue dealing with G. E. Hermetics is particularly interesting.



# SERVICE KINKS

## Tools and Equipment You Can Build



Under this heading will appear simplified or short cut methods of performing individual service operations; also details of how you can build special tools and equipment for your own use. Readers are invited to submit information for publication under this head.

## A Capacitor Tester

The second prize winner in the recent Service Kink and Tool Contest conducted by this journal.

By J. P. ISEMAN, JR.

MY experience in refrigeration service and repairing, indicates there has always been need for a simple and compact tester for capacitors. My answer to the need is the tester shown in Fig. 1.

By connecting the line lead to 110 volt a.c. and the capacitor to leads marked "test" the following tests can be made:

flash, the capacitor under test is shorted, thereby discharging capacitor No. 3 through the short.

In testing the larger capacitors, the switch No. 5 can be left open and the results will be the same, but the smaller ones will not furnish enough kick-back to flash lamp No. 4 without the assistance of No. 3.

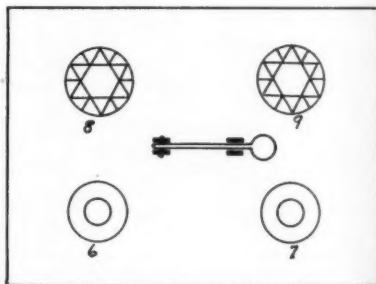
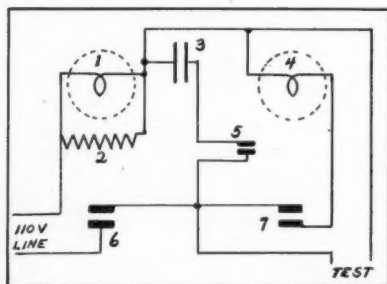


FIG. 1. A CAPACITOR TESTER

- (1)—110-v. Lamp
- (2)—600-watt Resistance
- (3)—120-mfd. Capacitor
- (4)—6-v. Auto Lamp

- (5)—S.P.S.T. Switch
- (6) (7)—Push Buttons
- (8)—Green Bull's Eye { license plate
- (9)—Red Bull's Eye { fasteners

With Switch No. 5 open, push button No. 6. Light No. 8 will not light on an open capacitor. It will light on a good or shorted capacitor.

Close Switch No. 5, push button No. 6 to charge capacitor No. 3 and capacitor under test—light No. 8 will light.

Push button No. 7, and light No. 9 should momentarily flash, caused by the discharge of the capacitors. If the light does not

flash, the capacitor under test is shorted, thereby discharging capacitor No. 3 through the short.

By using a smaller lamp in No. 4, the smaller capacitors will flash the lamp with switch No. 5 open, but the larger ones will burn out the lamp; therefore, we balance the difference by employing a capacitor within the tester.

Most of the above material can be found in the average shop scrap heap, using an old iron element for the No. 2 resistance, the bullseye out of old license plate fasten-

ers with the reflecting material scraped off the back. The resistance has to be employed to furnish enough current to charge the capacitors.

The capacitor No. 3 should be a good one. However, it can be tested at any time by leaving test leads open and using the same testing procedure with switch No. 5 closed. The kick-back flash will be fairly dim. Light No. 1 is an ordinary house light of 60 or 75 watts. Light No. 4 is an ordinary car dash light bulb. Not having a socket to fit, I soldered a bracket and wires direct to the bulb base.

The switch No. 5 can be any conventional type S.P.S.T. switch. However, I used a

small knife switch taken from a discarded Willard A-B Eliminator.

The push buttons Nos. 6 and 7 can be any type, as long as the contacts do not stand too close together when in the off position—especially No. 7, to keep from discharging the capacitor as fast as it is charged.

By connecting a plug in arrangement across the integral capacitor you can use it for testing and running a motor in the absence of a proper replacement capacitor.

I used a panel of Masonite about 8 inches square. This can be mounted in a test panel or in an individual box. This little instrument will make a very handy accessory for the shop that does a lot of sealed unit work.

# Testing Apparatus for Shops

By L. K. WRIGHT

EVERY shop, large or small, has a need for testing apparatus to speed up work on overhauled jobs and to check the results of such reconditioning. Nothing is more injurious to an organization's reputation than to have a customer complain that the newly overhauled system does not show the least improvement, or still worse, the system does not seem as good. Time and money is lost as a result, while customer dissatisfaction has only started.

The apparatus shown in the illustrations provides an idea as to the general appearance and set-up of the test equipment. This apparatus is used for the testing of compressor valves, compressor seals, expansion valves, thermostatic expansion valves, pressurestats, intermediate devices for high side float systems, and all brazed or silver soldered assemblies. The manner of testing or setting these parts will be outlined later, following a description of the equipment.

While the photographs (Fig. 1, Front Cover, and Figs. 2 & 3) show the testing outfit mounted on an angle iron base provided with short pipe legs, any type of base may be used. The base shown was really one obtained from an old Iroquois unit.

Another base secured from another obso-

lete unit was shortened somewhat and mounted, as shown in Fig. 3, at the rear of the assembly to act as sub-base for the motor and compressor. It consisted of a piece of thin iron formed into an eight-inch channel, with two-inch edges and was cut down to 18 inches in length. The main base itself measures 21 inches by 13 inches wide.

On the sub-base a single cylinder Kelvinator compressor was bolted fast, driven by a  $\frac{1}{8}$  h.p. motor. Of course, any compressor can be used for the assembly, but overhaul it first so that it functions efficiently.

A work shelf of hardwood  $\frac{3}{4}$ -inch thick by 12-inch by the width of the apparatus (13 inch) was bolted fast to the iron frame and an upright piece of hardwood, 18 inches wide by 11 inches high was secured in place by bolts to act as a gauge board or panel. A strip of angle iron,  $1\frac{1}{2}$  inch by  $1\frac{1}{2}$  inch was fastened to the top of this upright panel, so that the control valves would have a good sound edge to fasten to. (See Fig. 3.)

The discharge of the compressor was connected to a small upright receiver, reclaimed from a scrapped unit. This receiver (8 inch diameter by 9 inches high) was bolted in place between the motor and compressor, as may be observed by reference to Fig. 3.

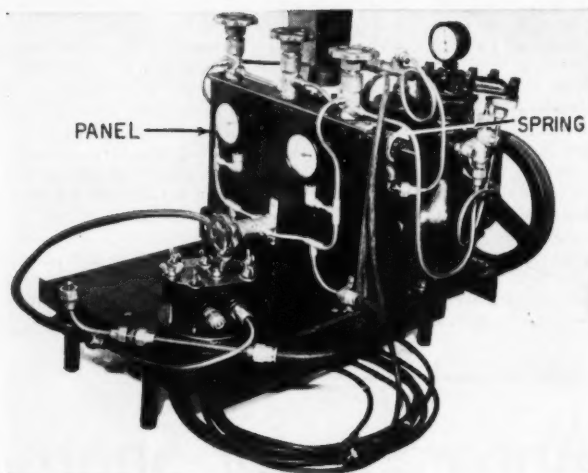


Fig. 2.—Side view from compressor side

#### Compressor Control

An old Zerozone pressurestat was converted to act as a cut-in and cut-out instrument, by putting a heavy spring on the outside of the case, over the control or setting knob. Refer to Fig. 2. The mercury tube was reversed in its cradle. Of course, the tubing from this control was tied into the valve on top of the receiver, as shown in Fig. 2 and the valve itself left cracked off back seat so the control would function. This control was set to cut-in and cause the motor to operate at any point under 40 pounds pressure and to cut-out at 60 pounds. Naturally, almost any pressure device can be converted and used for the purpose. Most shops have quite a few old machines from which the bases, motor, compressor, receiver and pressure control can be salvaged and an assembly of similar type to the one described can be constructed. Use whatever is at

hand and alter the assembly to suit.

A snap switch was installed on top of the pressurestat (see Fig. 3) so the motor could be stopped or started without recourse to the control. If desired, a double pole, single throw switch can be used, but the snap switch is shielded and the operator will not receive a shock if he inadvertently makes a hasty grab for this type of control.

The valve arrangement used was a simple one; the two valves at the right and left mounted on the angle iron edge (see

Fig. 1) were of the three-way line shut-off type, while the two valves seen mounted in the center of the panel were of the two-way type. These valves are shown in Fig. 5. The schematic sketch shown in Fig. 4 serves to provide data as to the connections required, not only for the valves but for the gauges and test ends.

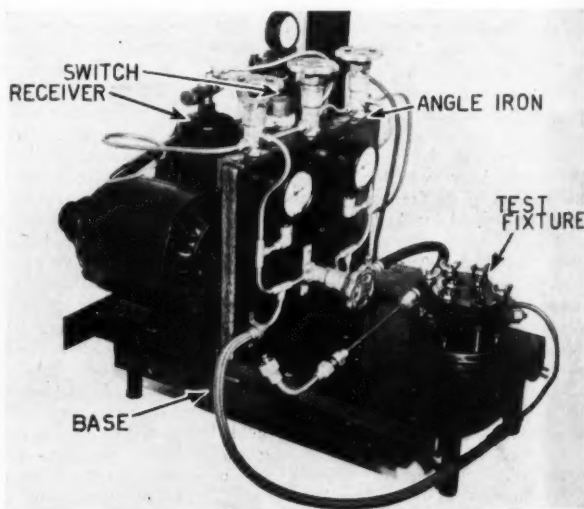


Fig. 3.—Side view from motor and receiver side



The valve arrangement can be somewhat improved if the builder does not mind the added cost. Two extra valves of the three-way line shut-off type can be inserted as shown dotted in on the illustration of the valve hook-up. They would serve the purpose of furnishing a little more ease in

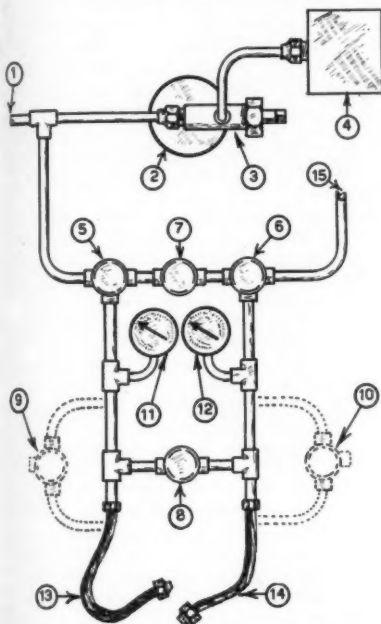


FIG. 4—SCHEMATIC PLAN OF HOOK UP

1. Line from Compressor Discharge
2. Receiver
3. Receiver Valve
4. Pressurestat
5. Pressure Valve
6. Vacuum Valve
7. Upper By-Pass Valve
8. Lower By-Pass Valve
9. Pressure Bleeder Valve
10. Vacuum Bleeder Valve
11. Pressure Gauge
12. Vacuum Gauge
13. Pressure Tube
14. Vacuum Tube
15. Line to Compressor Suction

manipulating the pressures while testing some apparatus and their added cost offset by the speedier testing possible with the equipment.

#### Gauges and Hoses

The two gauges used were of the compound type,  $2\frac{1}{2}$  inch size, having a range of 30-inch vacuum to 90-pound pressure, with the corresponding boiling temperatures for Freon, methyl chloride and sulphur dioxide

given directly on the face. Through their use expansion valves and pressurestats can be set by reference to pressure or by direct reference to the refrigerant to be employed. These gauges were inserted as apparent in the photographs and as per Fig. 4.

Two lengths of the so-called "charging hose" were used for flexible test leads. The flexible, non-metallic, non-rubber type is preferable as it is not affected by oil, grease or refrigerant, whereas hoses of rubber soon disintegrate, especially if any F-12 is present. These charging hoses (Fig. 5) come in sizes varying from 12 to 36 or more inches. The 24-inch length has proven the best for the purpose. S.A.E. connections of  $\frac{1}{4}$ -inch size should be specified for the ends of these tubes.

The photographs show a special test fixture for the checking of a discharge valve, with one of the flexible leads connected. This illustrates the manner of employing the flexible test leads.

The apparatus is so simple that any refrigeration mechanic can assemble a like equipment out of the odds and ends found around the average shop. It may be a portable affair, as shown, for use in the larger shops or can be assembled directly on the work bench, if desired.



FIG. 5.—VALVES AND FLEXIBLE LINES

Large shops can run two lines from such equipment and make pressure and vacuum available right at the individual work benches. Air pressure of about 50 pounds is a handy thing to blow dirt or chips out of holes, castings, crankcases, to clean lines, blow dirt from condensers, etc.

Fig. 5 illustrates the valves and hoses used in the assembly of the equipment, but this

hook-up can be altered to suit conditions or individual ideas of assembly.

### To Test Compressors

On compressor overhauls, where new seals and valves have been installed, or where the old parts have been ground and lapped, place the compressor on the work shelf. Front seat the suction service and discharge service valves on the compressor. Attach the pressure tube to the service port on the discharge service shut-off valve by means of a half union and attach the vacuum tube to the service port of the suction service shut-off valve. Make sure all joints are tight and that valves are fully seated.

Have the pressure valve open, the upper and lower by-pass valves closed and have the vacuum valve open. The snap switch is then thrown so the motor starts. This will result in a vacuum being drawn in the crankcase, while a pressure is being built up on the head. If the pressure goes up too quickly or if the pressurestat should cut-out, use the pressure bleeder valve or loosen the flare nut on the flexible line at the discharge service shut-off valve, to bleed off the excess.

Run apparatus, manipulating the pressure bleeder and vacuum bleeder valves until a 28-30 inch vacuum is pulled on the crankcase and a 55-58 pound pressure exists on the head. Then stop the apparatus by means of the snap switch. Watch the gauges. If the vacuum in the crankcase holds or loses but an inch or two, the valves are tight and the seal is in good order as well.

If the seal is suspected of being bad, close the vacuum valve and open the upper by-pass valve. This will admit air into the crankcase and build up pressure, so that the air can be detected hissing past the seal, or the leakage of oil will indicate its leaky condition.

This is a rapid means of testing the valves, seal and gaskets on overhauled compressors, as it is possible to obtain a quick check without recourse to installing the compressor and testing under its own power. Often times only the compressor is removed to the shop and if it is delivered after overhauling, placed on its base and then proves to be defective in valve operation, or shows a seal or gasket leak, a great deal of time will be lost.

### Testing Expansion Valves

Connect the pressure tube to the inlet side of the expansion valve and have the vacuum tube connected to the outlet port.

Have upper and lower by-pass valves closed. The pressure and vacuum valves should be open. If a vacuum bleeder valve and a pressure bleeder valve forms a part of the test apparatus, have the former open and the latter closed.

Start the machine and allow to operate until a pressure of about 50 pounds is built up on the pressure side, at which time close the vacuum bleeder valve so no more air is drawn into the system. Keep the machine running and watch the low pressure gauge. Adjust the expansion valve for the desired back pressure. Move the adjustment above and below this desired point, to prove the valve is adjustable and leave valve at proper adjustment.

Then stop machine and watch the low pressure gauge. If the vacuum is held or if vacuum only loses an inch or two the needle is seating properly and the valve may be marked O. K. Such a valve can be tagged with its setting or immediately issued to replace another defective valve and the service man will not have to lose time adjusting such a valve.

When assembling an expansion valve make sure a little oil is placed on the needle and seat. A dry seat will not seal properly.

### Testing and Setting Pressurestats

The pressurestat need only be attached to the vacuum tube. Have the upper and lower by-pass valves closed. Close the pressure valve. Have the vacuum valve open. Now start machine. If no air pressure exists in the receiver leave vacuum bleeder valve open until a pressure of 40 pounds or so is secured, then close it. The hook-up is then ready for the test.

Now watch low pressure gauge and read cut-out pressure when pressurestat snaps to the off position. If this action is too fast, crack the upper by-pass valve slightly. This will slow down the reduction of pressure and make it easier to check the cut-out. If not correct, reset for desired reading.

When the cut-out is secured snap the switch on the test apparatus to the off position and if the upper by-pass is not already cracked open slightly, set it this way. This will allow air pressure to build up in the pressurestat. Watch the low pressure gauge for the cut-in point.

Repeat until both cut-in and cut-out have been checked. Reset the pressurestat for the desired conditions and check several times to prove in proper working order.

A pressurestat can be quickly and easily

set for a standard condition by use of this apparatus. The mechanism can be checked for proper operation and any stickiness or delayed action can be detected and corrected before it is sent out of the shop. If to be stocked be sure to record the setting, both cut-in and cut-out, on the tag.

### Testing Low Side Floats

If a low side float has been removed for overhauling, cleaning, etc., it is an easy matter to check this assembly. For instance, a new needle may have been installed, the seat cleaned or replaced, or perhaps the old needle and seat have merely been polished.

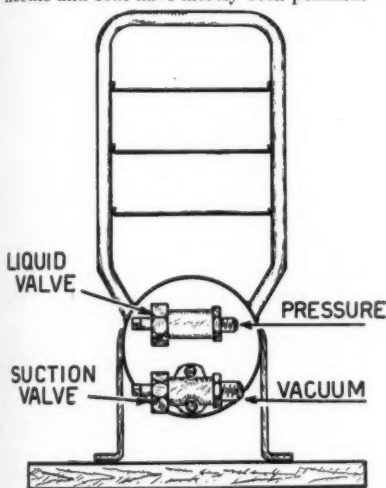


Fig. 6.—Showing the position for testing a low side float

Turn the low side float assembly upside down, as per Fig. 6. Connect the vacuum tube to the suction or gas valve on the low side float. If no valve is present tie on to the gas opening by means of the proper flange. Connect the pressure tube to the liquid valve or flange pad on the low side float.

Have the pressure and vacuum valves open. Have the upper and lower by-pass valves closed. Have the pressure bleeder valve closed. If no pressure is in the receiver of the test apparatus it will be necessary to leave the vacuum bleeder open until the machine has sucked in enough air to provide about 55 pounds of pressure in the receiver. Then this valve should be closed.

Allow the test machine to run. With the hook-up just outlined a vacuum will be drawn on the low side float assembly. If the needle and seat are in good condition it will be possible to draw a good vacuum on the low side float assembly. A bad seat, a worn needle, or where gum or dirt is holding the needle off seat, will be indicated by a hissing noise and hardly any or no vacuum can be secured.

If the vacuum can be drawn to about 25 inches, stop the test machine and watch the low pressure gauge. A well seated needle will hold this vacuum. A leaky needle will be indicated by the vacuum being broken, slowly in the case of only slight defect.

### Checking Intermediates

On some of the new high side float valve systems an intermediate device is used, its purpose being to eliminate frosting of the line leading from the high side float to the evaporator. These devices require a certain pressure differential. To test, install with the high pressure air entering the inlet side of the intermediate. Attach the vacuum tube to the outlet side.

Operate the apparatus with the upper and lower by-pass valves closed and the pressure and vacuum valves open.

A new intermediate can be used to check and determine the pressure differential it operates under and then the repaired intermediate can be tested to determine if it is correctly calibrated.

Removal of some of the spring tension or removal of metal from the weight will result in lowering the pressure at which it will open, while an increase will serve to raise the pressure.

Intermediates are of three classes, viz.: spring loaded check valves; weight loaded check valves and the so-called large size capillary tube. In the case of the latter the position is not important, but with the spring or weight loaded type these intermediates should be tested in the vertical position.

\*\*\*

Ray Smith  
Oklahoma

You will find enclosed my remittance of \$1.25, for which you will please send me the binder as illustrated in the last issue of THE REFRIGERATION SERVICE ENGINEER I would pay much more than the price quoted above rather than lose part or all of my copies of the magazine.

## The Question Box

Readers are invited to send their problems pertaining to the servicing of household refrigerators and small commercial refrigerating equipment as well as oil burners to "The Question Box."

### COMMENTS ON QUESTION 299

**QUESTION BOX:** This is in reference to Question 299 shown in the Question Box on page 33 of April issue of The Refrigeration Service Engineer.

I think the gentleman asking the question is just a little bit confused, for I think his real problem, in the case of a Norge, where the head pressure falls and the back pressure rises when the compressor stops, is due to a leaky check valve.

If it is impractical to replace or repair the check valve, then the suction line could be disconnected, and a standard check valve obtainable from jobbers, could be inserted in the suction line, adjacent to the suction valve on the compressor, and the problem will be solved.

The rotary type compressor does not have a discharge valve like the reciprocating type, hence when the compressor stops, the pressure from the highside will, if not checked, travel immediately to equalize with the low-side. Hence the necessity for a check valve which holds tightly between the compressor and the evaporator circuit.

*Very truly yours,*

*K. N. Newcum,*

*Superior Valve & Fittings Co.*

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### HOT GAS DEFROSTING

**QUESTION 302.** I recently installed a meat display case, which was an 8 ft. case and a 1/3-hp. condensing unit. The case has a built-in hot gas defrosting coil for the drain gutter of the baffle.

I connected the defrosting coil to the compressor discharge line through a three-way valve, and to the outlet side of the expansion through a three-way valve. When I use the defrosting coil by opening the two three-way valves, I get liquid and saturated gas back to the compressor through the suction line. This causes oil pumping. I suppose the gas

condenses in the defrosting coil and evaporating coil.

Could it be possible that saturated refrigerant is leaving the receiver up through the condenser, and then into the defrosting and evaporating coils? If this could be, wouldn't a check valve in the condenser line between the three-way hand valve and condenser stop this? Of course, this would allow only refrigerant gas that circulates through the coils to re-circulate since the check valve would prevent any from the condenser to circulate.

Why aren't heat exchangers used on ammonia machines? They may be, but I have never seen any.

Can an alcohol leak detector be used to find leaks on all the Freon refrigerants, such as F-11, F-21 and the other Freon gases; also, on methyl formate and Carrene?

**ANSWER:** I am not sure that I understand the hook-up you describe, using the hot gas defrosting coil in the drain gutter. This is something apparently quite new, and I have never heard of its application before.

However, I don't believe that such a hook-up will ever work satisfactorily when used on a single coil installation. Defrosting by this means will very seldom work out in that manner. Hot gas defrosting can only be used satisfactorily on multiple hook-ups, where the valving arrangement is such that one coil may be temporarily used as a condenser, while the machine is operating and normally refrigerating the other coils. Apparently, the cabinet manufacturer, when including this defrosting coil in their refrigerator, took it for granted that in most cases, the case would be hooked-up in multiple with some other equipment. I would say in the single coil installation, the natural thing to expect is the condition you are now experiencing.

There is no reason why heat exchangers could not be used on ammonia machines. However, as a usual thing, these machines have sufficient over-capacity so they do not

need to consider such fine points as this type of equipment.

Alcohol leak detectors can be used on any of the gases you have mentioned.

### UNIT COOLER TROUBLES

**QUESTION 303.** Having recently completed the following installation, I would very much like to have your opinion as to why it has proved so unsuccessful as a pressure-controlled unit:

The condensing unit is a 1-hp. vertical twin compressor (2 inches x 2 inches), operating in two cold rooms, each cooler fan controlled by its own thermostat, the idea being to operate on a defrosting cycle. Temperatures required were 35 degrees F. to 38 degrees F. in one room, and 38 degrees F. to 40 degrees F. in the other. Pressure control settings were given as 6/24 lbs. per square inch (methyl chloride).

The trouble encountered was the low back pressure (8 lbs.) with the coils completely refrigerated, and the tendency to short cycle, even with the cut-out lowered to 4 lbs., especially when one cooler fan had stopped. The worst complication, however, was the fact that when both rooms were down to temperature and the machine had cut out, the pressure would not build up above 20 lbs. again when the machine was idle for any length of time, yet the room temperature would be above 40 degrees F.

The following were the operating conditions:

Ambient temperature—50 degrees F. = 37 lbs. gauge

Condensing pressure—72 lbs.

Suction pressure—9 lbs.

Is the compressor too big and fast, and the system consequently short of refrigerant? Isn't the back pressure too low for this type of job?

**ANSWER:** The pressure control, I believe should be set for a 12 lbs. cut-off, and a 27 lbs. cut-in pressure, and not lower than 10 lbs. cut-off pressure. Unless the coils are very much too small for the job, these pressures should be satisfactory.

The starved condition of the coils may be due to three things. First, low on gas, which I think is improbable. Second, expansion valves have been adjusted in the field, and are now closed too much. Third, to the low ambient temperature at the compressing unit.

The fact that you have a 50°F. temperature, and a gauge pressure of about 37 lbs. I believe, will explain the reason that the

machine will not start again after an idle period of any length. This, also, may be the chief cause of the starved condition of the coil. However, since the condensing pressure builds up to 72 lbs. during operation, it should operate okay until another idle period of some length prevents it from starting.

While the machine is not too large for average conditions, such as 75 to 90° room temperature, there is no doubt that with a 50° ambient temperature, you have more capacity than is needed, which will account somewhat for the short cycling. For a start in overcoming this trouble, I would suggest that the pressure control be readjusted to the higher pressures, and that some means be provided to keep this machine at a warmer temperature. After noting the improvements, if any, I would next readjust the expansion valves so that an average suction pressure of 14 or 15 lbs. is obtained. The most accurate way of making this adjustment would be by removing the valves and adjusting according to the method described on page 12, of the January, 1938 issue of THE REFRIGERATION SERVICE ENGINEER.

In making these suggestions, I am taking it for granted that a 50°F. ambient temperature is only a temporary seasonal condition, and that the conditions will probably change with the coming of summer weather. If, however, this temperature for some reason is fairly constant, then I believe the machine is too large, and should be reduced in capacity. Not knowing the heat load, I would not be too sure of this statement.

### CAPILLARY TUBE SYSTEMS

**QUESTION 304.** I was called to service a Crosley refrigerator, the complaint being that the machine would not start. This trouble was caused by a sluggish thermostat, and after replacing the thermostat, I let the machine run and had my gauges connected. When the machine cut out, the back pressure was about 8 lbs. and the head pressure 65 lbs., (room temperature was 65 degrees F.) but within 5 minutes, the high pressure gauge showed a reading of only 10 lbs. There is sufficient gas in the system because the evaporator frosts up entirely, including about 2½ inches of suction line directly behind evaporator, with the thermostat set at its normal position. There is no air in the system, and the unit runs normally with regards to running time.



Please let me know why the head pressure should drop so rapidly, or is this a normal condition with Crosley refrigerators?

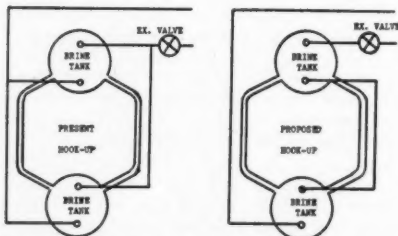
ANSWER: Apparently this Crosley refrigerator is of the capillary tube type, and in all refrigerators employing a capillary tube as the refrigerant control, you will find this same characteristic which you have experienced.

Capillary tubes constitute a restriction between the high and low sides of the system, but do not at any time completely shut off the passage of the refrigerant; therefore, it follows that as soon as the machine has shut off what little gas is contained in the condenser will leak over to the low side, thus balancing the pressure so that your high side pressure reading will be identical to the low side pressure. This condition is entirely normal, and apparently your machine is working satisfactorily.

### SUPERIOR REFRIGERATOR

QUESTION 305. Your name was given me by the Ranco Co. of Columbus, Ohio, as a possible source of information on the Superior household refrigerator, as the company manufacturing same no longer exists. Answers to a few questions would be helpful in putting one of these units back in operation. Is there any service data available on this unit? Was it originally charged with methyl chloride or SO<sub>2</sub>? On what r.p.m. should the compressor operate?

I am enclosing a sketch of the brine tank and connections on this unit, and my ideas for changing same. I would like your comments.



Illustrating the change in hook up on the brine tanks.

ANSWER: I am sorry to say that the only information I have been able to find on the Superior household refrigerator is the history of their bankruptcy, in which they were described as a company manufacturing household refrigerators and ice cream cabinets, employing a reciprocating type of compressor, charged with SO<sub>2</sub>. I do not know

at what r.p.m. the compressor should operate.

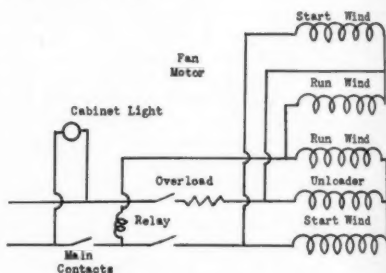
The suggested hook-up, as shown in your attached sketch, in my opinion should produce a marked improvement in this system. Certainly in the old hook-up, there is considerable danger of the gas by-passing in one of these tanks and oil being trapped in the other.

I would suggest that the compressor be run at about 450 r.p.m., as a trial.

### WESTINGHOUSE REFRIGERATOR

QUESTION 306. I have a Westinghouse hermetically-sealed unit—Model A.S.D.12—and have been having some trouble in trying to figure out the electrical unit.

Will the motor operate independent of the fan motor, or must the fan motor be in the circuit? If you can send me a wiring diagram showing the control, motor and fan in the circuit, I would appreciate receiving it, as well as any other data on the wiring circuit that you might have.



ANSWER: I am sorry to inform you that we have no information on the Westinghouse hermetically-sealed units, nor do we have a wiring diagram, which we can send you, but here is a sketch, which I have made up and which, I believe, will answer your purpose.

I am inclined to believe that the unit will not normally start with a fan motor out of the circuit, due to the fact that the relay coil depends on a certain amount of current being drawn through it to make it operate.

I am not just sure of this operation, but from the wiring diagram, it appears that the high current being drawn through the relay causes the switch to close, which throws in the starting winding. Immediately the motor is up to speed and the current is reduced, the relay is permitted to fall by its own weight, breaking the circuit to the starting winding.



## WHAT LENGTH CAPILLARY TUBE?

QUESTION 307. I wish you would give me some information on how to figure the pressure drop through capillary tubing. I think this drop is proportionally equal to length of tube and inversely proportional to diameter. What are inside and outside diameters of capillary tubing used on Grunow and Crosley refrigerators; also, length of these tubes?

ANSWER: The size and length of capillary tubes used on various refrigerators will usually vary somewhat in accordance with the size and capacity of the machine; therefore, it is usually advisable when you are replacing this tube with one of your own make that the length and diameter be measured.

Capillary tubing may be purchased on the market in sizes of .095 and .125 outside diameters. This will give an inside diameter of .031 and .061. I believe for the Grunow and Crosley refrigerators, the smaller size should be used, and the length would be approximately 10 feet.

We have no definite data of this nature from which I may inform you of the exact size and lengths. However, the above should be very close.

## LIPMAN MODEL 81

QUESTION 308. Concerning a Lipman Model 81 ammonia refrigerating unit in connection with a milk cooling vat: Late last year, this plant went through a fire which destroyed the barn and most of the equipment in the milk house. The plant was badly heated and, of course, had to have many parts and repairs. I volunteered to do this job of rebuilding. Every part was thoroughly cleaned, and those that needed to be renewed were given new parts. The evaporator coils in the vat were removed and placed in such a position that practically all the cleaning agent would drain once it was started through one end of the coils. A special pump was connected to one end and about five gallons of gasoline, followed by three gallons of carbon tetrachloride, were forced through repeatedly until a clear solid column of liquid was noticed. All sorts of scale and foreign matter were removed this way before finally connecting to the unit.

The plant was put in operation August 3, 1938. In short, the unit bore the appearance and functioned exactly as well, the owner told me, as when it was new, thus giving complete satisfaction up until about a

week ago. I was called to the scene because it did not refrigerate. I found the low side gauge pressure was 15 inches, when normally for best results, it is around 35 lbs. The first thought was the expansion valve, which might be at fault. It was stuck shut, and worst of all, the large filter in the valve was badly clogged with a fine brown sandy material, intermixed with particles of blue resembling blue vitriol. Around the needle, and in fact, all of the interior of the valve, was a tough gummy substance, rather difficult to remove. Finally I removed the scale trap cover, and to my surprise, found an even worse deposit there. The filter assembly was completely eaten up. Only a few fragments of the screen remained, intermixed with the above mentioned substance. There were more blue particles there than in the expansion valve screen. New filters have been ordered, and when they arrive, will put the plant in operation again.

What is bothering me at present is the cause of the scale trap screen being decomposed in so short a time, and what might I do to prevent this happening again?

What is the approximate capacity in B.t.u. per 24 hours of this machine? It is run by a  $\frac{3}{4}$ -hp., 1750 speed motor, double "V" four-inch pulley on motor to 14-inch pulley on compressor, bore  $2\frac{1}{2}$ -inch x  $2\frac{1}{2}$ -inch stroke.

What is the capacity of an ethyl chloride Welsbach Scotch yoke drive compressor,  $3\frac{3}{4}$ -inch bore x 1-inch stroke, run at about 450 r.p.m.?

What kind of oil for this compressor, using ethyl chloride, and where can ethyl chloride be obtained?

ANSWER: I believe there are a number of possible causes for this condition, and about all one can do is to make a few suggestions, which may help in overcoming the trouble.

The first thought that comes to mind is that in the method used in cleaning the coil, it is possible that all the carbon tetrachloride, and perhaps all the water were not removed before assembling and charging the unit. While carbon tetrachloride and ammonia alone, or small quantities of water and ammonia alone may not cause any trouble, a mixture of ammonia, carbon tetrachloride and water may produce a trace of free hydrochloric acid. This acid condition then may cause any accumulation of carbon, dirt, etc., which is deposited on the walls of the pipe in the system, to loosen and circulate with the gas. This may then account for the sandy deposits found.

The fact that the screen was almost all

decomposed, and flecks of blue coloring found, makes it appear that copper or brass screens were used, and the ammonia with the small amount of water present attacked them. I take it for granted, however, that you are familiar with the fact that copper or brass cannot be used in ammonia systems.

The gummy substance may be due to two things: First, if you used any new pipe in the system, this gummy substance may have come from the rustproofing, or coating, which is put on black pipe, and which may have become loosened and circulated through the system. Second, it may be due to a combination of the carbon tetrachloride, water and ammonia coming in contact with a hot surface. This would be a similar condition to that occurring in methyl chloride systems. I understand that the Lipman machine normally runs with a rather hot liq-

uid line, which would help the formation of this gummy substance.

Whatever the cause may be, I am of the opinion that your only course now is to blow all the gas out of the system, and change the oil, doing as good a job as possible of completely evacuating the system. After the proper screens, etc., are installed, and the machine again placed in operation, it would be a good plan to inspect and clean the scale trap about once a month until indications show most of the dirt and scale have been removed.

The approximate capacity of this machine, so far as I can discover, would be about 8,000 B.t.u. per hour. The capacity of the Welsbach unit would be about 1,700 i.m.e. per 24 hours. Gulf Eskimo oil was originally used in these units. However, I believe that other brands of oil, with a viscosity of 300 or more, will be satisfactory.

## Household Refrigerator Controls

By G. E. GRAFF \*

ANY discussion of this subject in detail would be almost endless but a study of a few important basic points should clarify most of the service engineer's control problems.

All refrigerator controls have some form of power element which is responsive to temperature changes to furnish the motive power to operate the switch.

These power elements may consist of, (a) metallic bellows connected directly to the suction side of the refrigeration system responding to pressure changes of the refrigerant in the system itself, or (b) a power element consisting of a metallic bellows connected by a capillary tube to a bulb and this assembly filled with an expansible vapor. This vapor within the bellows, capillary tube, and bulb, contracts or expands in response to temperature changes and thus provides the necessary power to operate the switch.

Power element bulbs are made in many sizes and shapes in accordance with the ideas of application engineers, and the power element manufacturers. Some bulbs of recent

design are made by winding or twisting part of the capillary tube in either a tight or an open coil.

Power elements are charged with various gases depending upon the temperature range at which they are to be used. This power element charge has no relation to the gas of the refrigerating system to be controlled. For low temperatures, such as ice cream cabinets, power elements are usually charged with Propane or Freon.

For medium temperatures, such as household refrigerators, the power elements are usually charged with methyl chloride or sulphur dioxide.

For higher temperature applications such as beverage or water coolers, power elements are often charged with sulphur dioxide, isobutane, butane, etc.

At one time some power elements were charged with a measured amount of liquid refrigerant. It was extremely difficult to measure the small quantities of refrigerant used in such charging and the expansion of this charge often exceeded the strength of the bellows when it was subjected to a high temperature and the bellows would be ruptured from the excessive vapor pressure.

\* Sales Manager, Ranco, Inc., Columbus, Ohio.  
Presented before the fifth annual R.S.E.S. Convention at Buffalo, N. Y.

"Limited" or "Saturate Vapor" charges are now used wherever the bulb will always be coldest part of power element. The modern saturate vapor filled power element is charged with vapor only at a temperature above the highest temperature to be controlled. There being no liquid to change to vapor at any higher temperature, the pressure does not continue to increase materially with rising temperatures.

To determine if a power element has lost all or a portion of its charge, proceed as follows provided no internal changes have been made in the control from the original factory setting. Be sure that the manual switch is in the "on" position:

(A) An entire loss of charge is indicated if, when entire control is warm the contacts remain open when the dial pointer is set in "cold" position.

(B) A partial loss of charge is indicated if, when entire control is warm, contacts are open when dial pointer is set in "defrost" or "warm" position, but close when the pointer is turned to a "colder" position.

When there has been either a total or partial loss of the power element charge, replace the entire power element with a new one as field repairs are not practical. Power elements of a given type and fill are interchangeable and their exchange will not alter the settings more than a few degrees.

General instructions for readjustment of all thermostats are not practical but thermostat manufacturers are usually glad to furnish instruction for any or all of their models. In general, we can say that increasing the pressure of the large (or range) spring raises the temperature operating points and the reverse. The differential or difference between cut-in and cut-out is adjusted by a separate spring. Many later models have fixed differentials which cannot be changed.

The temperature setting required for each model refrigerator is carefully worked out by laboratory tests to give the maximum operating efficiency, with proper food compartment temperatures and satisfactory ice freezing.

With the many different designs and capacities of refrigerating equipment, varied temperature settings and dial ranges have been required. Variations of dial ranges are obtained by use of different combinations of springs and screw threads or cams. Often thermostats looking exactly alike are very different in settings and cannot be adjusted to be interchangeable. With thermostats

having fixed differentials, the length of running cycle cannot be increased or decreased.

Dial range or "Cold Control" is the user's adjustment to obtain faster freezing or vary the box temperature at will. The total number of degrees changed will, of course, vary from the combination of large evaporator and small compressor using a small temperature range, to the combination of a small evaporator and a large compressor requiring a wide temperature range in order to have the correct running time.

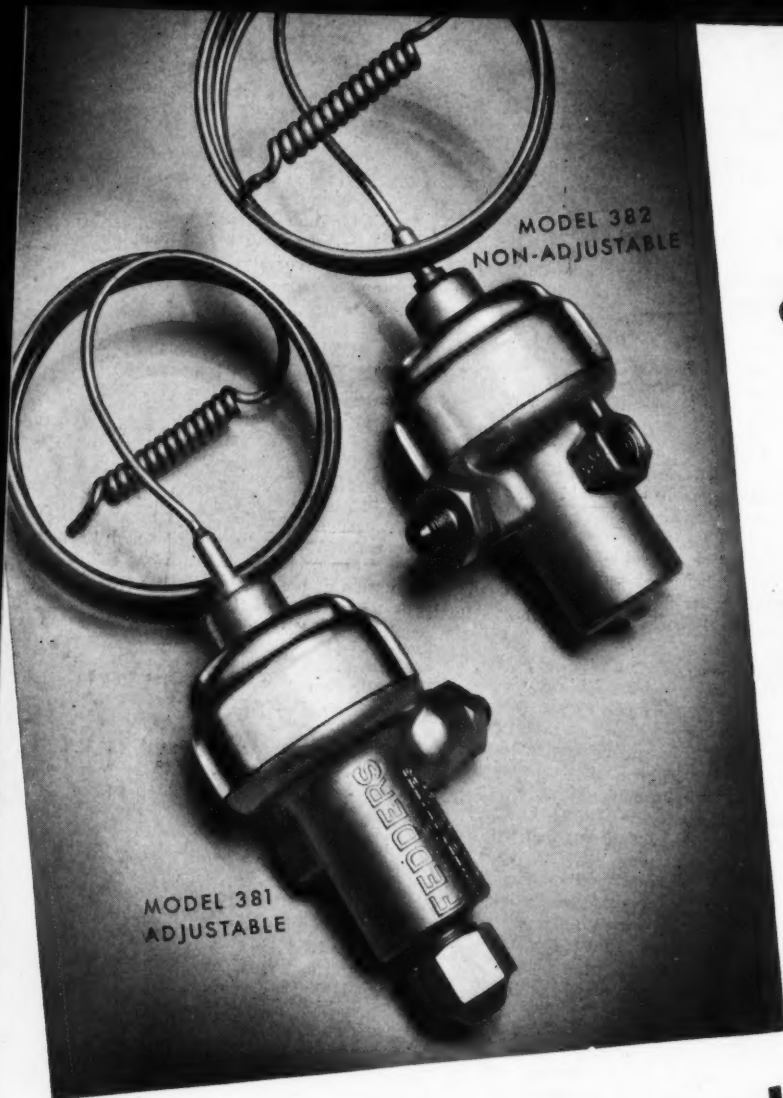
Dial DEFROST or VACATION positions have CUT-IN temperatures high enough to permit frost melting during the off period. A refrigerator may have to operate for many hours on this setting in order to complete the defrosting.

Semi-automatic defrost is positioned manually but the thermostat automatically returns to a normal operation after the evaporator reaches a temperature high enough to have caused one complete defrosting.

A tabulation of temperature settings used in the past years reveals the following average settings for the various type cooling units:

Application	Cut-Out	Cut-In
Brine Tanks, Wet or Dry system:		
Bulb attached to side of tank.	17° F.	29° F.
Bulb attached to suction outlet .....	16	27
Bulb immersed in brine, not touching evaporator.....	17	25
Bulb immersed in brine, touching evaporator .....	11	26
Copper Evaporator, Wet system.		
Bulb on frosted tube.....	14	28
Copper Evaporator, Dry system.		
Bulb on finned dryer.....	20	40
Bulb on ice tray sleeve.....	20	28
Bulb on frosted tube.....	15	28
Porcelain Evaporator, Wet system (high or low side float or capillary tube).		
Bulb on side.....	15	28
Bulb on heater.....	15	30
Porcelain Evaporator, Dry system.		
Bulb on side.....	15	28
Steel Evaporator, Plated, Wet system.		
Bulb on side.....	12	27
Stainless Steel Evaporators.		
Bulb on side.....	7	23

All of these various control settings accomplish the same ultimate result. The cut-in is just below the point at which the evaporator begins to defrost and the cut-out is



On Display and In Soc

**FEDDERS**

MANUFACTURING COMPANY  
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low enough to give the proper running cycle to cool the refrigerator. Thermostats should not change during use and one which is known to be erratic should be replaced, as its repair is a shop operation.

Hand reset motor overload protectors of the "Solder Well" or "Eutectic Alloy Film" type were formerly incorporated in refrigerator thermostats and bi-metal latch type of motor protectors have also been used to some extent. With the Solder Well type, after functioning of the overload, it is necessary to allow several minutes for the solder to cool and set before reclosing the manual switch on the thermostat.

Each refrigerator manufacturer determines the load that his motor will safely carry and recommends overload coil ratings accordingly. In the absence of this information you may select overload coil ratings based on 140 percent of the full load current of the motor, as shown by the name plate.

The early motor protectors used in thermostats were not "trip free" but this feature was made on Underwriters' requirements. The "trip free" feature assures opening of the contacts even if the reset button is held in the "on" position. The reset button always indicated when the switch was open. Recently these have been superseded by automatic reset type motor protectors attached directly to the motors.

When making service calls remember the following common complaints and their causes, and do not make unnecessary thermostat replacements which do not cure the real trouble:

#### Off-On Switch Does Not Stay in "On" Position

1. Ampere rating of overload coil is too low.
2. Head pressure is too high.
3. Compressor is sticking.
4. Voltage is low.
5. There is motor trouble.

#### Short Cycle

1. Capillary tube of thermostat touches some point of the chilling unit that is colder than the bulb of the power element.
2. Expansion valve or float valve leaks.
3. Thermostat differential is too short.

#### Long Cycle

1. Too much frost on chilling unit.
2. Refrigerator compartments are overloaded with warm food.

3. Cabinet is too close to wall for circulation of condensing air.
4. Cabinet door does not fit tightly.
5. Thermostat differential is too wide.
6. Suction shut-off valve is partially closed.
7. Belt slips.
8. Air is in system.
9. Suction discharge valve leaks.

#### Will Not Cut-In

1. Overload reset button is not pushed in.
2. Bellows is discharged.
3. An open circuit is in the wiring.

#### Will Not Cut-Out

1. Temperature cut-out point is below the ultimate limit of the refrigerating system or inefficient compressor.
2. Power element bulb is not clamped tightly to chilling unit.
3. Clamp for thermostat bulb is not properly located on chilling unit.
4. Float valve or expansion valve is not operating correctly.
5. Part of the refrigerant is lost.

Since the removal of the motor protector from the thermostat and the adopting of stainless steel for cases, the size of thermostats has been reduced but the fundamentals of operation have not changed. New and more positive action of the toggles is noticeable and nearly all thermostats have silver contacts.

Mounting screw spacings have generally been  $3\frac{1}{16}$  to  $3\frac{25}{32}$  inch making general replacement controls practical but there have always been some special types of mountings which require *exact replacements*.

*Exact replacements* require no drilling of new mounting holes, additional materials, or readjustment of the thermostats. They have all the desirable features of the ones replaced, and often additional features.

A refrigerator service man often wastes his own time if he installs other than exact replacements when those exact replacements are available and the service engineer who familiarizes himself with these controls will save much time for both himself and his customer.

In the last few years many gadgets have been attached to thermostats, light sockets and their switches, remote control knobs, translucent dials and other attachments, which complicate matters for the service engineer.

Your suggestions and comments will go a long way in planning for future replacements of these devices.



# Manufacturers Discuss Problems at Spring Meeting

Consider Trade Practices and Business Trends at Successful Spring Meeting at French Lick, Indiana—Plans Laid for Second All-Industry Refrigeration and Air-Conditioning Exhibit—Name Changed.

FRENCH LICK, INDIANA, April 20 and 21, was the scene of considerable activity of the Refrigeration Equipment Manufacturers' Association (new name adopted for the association). Committee meetings and meetings of the Board of Directors occupied two busy days with some time available for those who were trying their early season golf.

President J. S. Forbes, Pittsburgh, Pennsylvania, presided over the meetings. The Board of Directors' and committee meetings occupied the business of the first day. Friday's sessions comprised an open forum for discussion by members on topics of timely interest on trade subjects. The Friday morning session was opened by H. V. Higley, President of Ansul Chemical Company, whose paper, "Considerations a Manufacturer Must Face in Classifying His Trades on Functional Lines," provided material for the further development of several phases of this subject for future meetings. The discussion on this paper was under the able leadership of A. B. Schellenberg, President, Alco Valve Company.

Program Chairman, E. A. Vallee, Vice-president, Automatic Products Company, who presided at the forenoon session introduced W. C. Allen, Vice-president, Modern Equipment Company, who delivered an address on "Squaring One's Sales' Policies With What One Hears From the Field." Valuable contributions were offered by G. E. Graff, Vice-president, Ranco, Inc., who led the discussion on this subject and the points made by Mr. Allen in his remarks. Concluding the morning session, K. M. Newcum, Secretary, Superior Valve and Fittings Company, presented a paper on "Future Trends of the Market for Refrigeration Parts and Supplies." H. E. Rieckelman, Vice-president, Fedders Manufacturing Company, a veteran in the refrigeration equipment industry himself, lead the discussion.

On Friday evening, the program was concluded with a banquet at which Leo H. Gorton, Machine Tool and Supply Company,

Tulsa, Oklahoma, President of the Jobbers' Association, addressed the manufacturers on "Jobbers' Conditions," and his address in part was as follows:

"Another matter on which I should like to touch this evening is that of trade outlets. First, let me say that we jobbers like to feel that we are your partners in the economical distribution of your products through proper trade channels to the service engineer or contractor who uses your products in his business. We desire to serve to the best of our ability as your sales department and, as such, welcome your constructive suggestions.

"We, in turn, should like from you individually and as a group as much consideration as possible in keeping your merchandise moving through properly controlled and legitimate trade channels.

"We have gone to some length to define a refrigeration supply jobber. We believe our present definition is truly representative of the functions we perform.

"We are attempting to keep our Association clean and its members truly representative of the type of business they profess to do.

\* \* \*

"Often manufacturers are tempted and do, where there are not sufficient legitimate jobbing outlets, give representation to a marginal house to which they themselves would blush to admit.

"We have some eighty odd members of our Association. We know of approximately eighty additional firms that do legitimately qualify for membership and who do a bonafide jobbing business. That, gentlemen, is about the number of strictly jobbing outlets as we see them in this country at the present time.

"I wish I could feel that you, as manufacturers, were extending your jobbing prices to no larger a group.

\* \* \*

"We have, from time to time, ever since I have been interested in Refrigeration and Air Conditioning Supplies, been threatened with what we consider unfair competition from national organizations interested chiefly in the sale of refrigeration and air-conditioning units, and who have also, we believe, attempted to place their secondary outlets in a position to compete or undersell the independent refrigeration supply jobber.

"We are aware of the fact that these concerns and others preceding them were not only in existence before the independent refrigeration jobber, but are actually responsible for the creation of the economic need which made our existence possible.

"We know that a number of you depend upon one or more of these national organizations for the marketing of a large part of your output which is used by them in the manufacture of original equipment which they merchandise nationally.

"We cannot, could not, and certainly do not expect you to pass up this class of business.

"Neither are we interested in the price at which you sell them so long as you sell them parts to form a part of a complete unit of manufacture.

"We are, however, vitally interested in that portion of their purchases of your product which are made for resale, whether they are purchased by the national manufacturer himself or through his negotiations sold directly to his franchised dealers.

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*for Hermetic Sealed Units*



Over 20 popular makes of hermetic sealed units can be purged or charged with this compact, inexpensive Kerotest Master Valve Set, thus eliminating the need for a separate valve for each hermetic unit. It consists of a simple master valve with adapters and stem extensions to fit all popular hermetic units, all neatly packed in a heavy gauge steel box to facilitate carrying.

The valve is designed with a gauge connection, independent of the service connection—an exclusive Kerotest feature that makes it possible to determine the pressure in the unit at any time during charging or purging without breaking the service connection.

Included in this time and money saving Kerotest Valve Set is a Bristol Wrench which may be used to loosen valves on machines requiring Spline Wrench. Chart in box shows which adapter to use for any hermetic unit. Ask your local Kerotest jobber, listed at the right, about it.

**KEROTEST MANUFACTURING COMPANY, Pittsburgh, Pa.**

Their business is not a jobbing business but, in our estimation, a natural trade outlet of the jobber and should be classed as such.

"At one time all replacement parts were sold by such national organizations. The growth and strength of our jobbers' organization is proof of the fact that they did not do a satisfactory job.

"We in the independent refrigeration supply jobbing business should be and I believe would be, if these national manufacturers would study the matter deep enough, found to be a very valuable ally to the satisfactory furnishing of parts and supplies for the maintenance of their equipment in the field.

"I believe you, as parts manufacturers, recognize this fact."

On Friday afternoon considerable business of the Association was transacted and a definite announcement that the dates for the second annual All-Industry Refrigeration and Air-Conditioning Exhibit would be the week of January 15, 1940, at the Stevens Hotel, Chicago, Illinois, was made.

The first selection of exhibit space for this exhibition was provided for at this meeting under the direction of M. W. Knight, Chairman of the Exhibits Committee, and all of the members of his committee, including F. J. Hood, Ansul Chemical Company, H. T. Hulett, General Electric Company, A. B. Schellenberg, Alco Valve Company, K. B. Thorndike, Detroit Lubricator Company, R. M. McClure, Secretary and Exhibits Manager, who were in attendance.



**EXHIBITS COMMITTEE**

Left to right are: A. B. Schellenberg, K. B. Thorndike, M. W. Knight, Chairman, H. T. Hulett and F. J. Hood.

At the banquet on Friday evening, J. F. Colyer, Vice-president, Wolverine Tube Company, and past president of the Manufacturers' Association, was presented with a handsomely engraved watch by Vice-president H. V. Higley.

M. W. Knight, Peerless of America, Incorporated, was presented with a set of table silver in appreciation of the work he accomplished as General Chairman of the Exhibits Committee of the First Exhibit.

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Official Announcements of the activities of the National Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.



## THE OBJECTS OF THE SOCIETY

To further the education and elevation of its members in the art and science of refrigeration engineering; for the reading and discussion of appropriate papers and lectures; the preparation and distribution among the membership of useful and practical information concerning the design, construction, operation and servicing of refrigerating machinery.

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- SIOUX CITY CHAPTER, SIOUX CITY, IOWA:** President, Frank Kutli; Secretary, Norman Lynum, 120 W. 4th St., Sioux City, Iowa.
- SPRINGFIELD CHAPTER, SPRINGFIELD, ILL.:** Meets 2nd and 4th Wednesdays. President, R. M. Potter; Secretary, A. L. Hammond, 319 W. Cook St., Springfield, Ill.
- TALL CORN CHAPTER, CEDAR RAPIDS, IOWA:** President, R. R. Kopsell; Secretary, H. H. Ullish, 1508 2nd Ave. S.E., Cedar Rapids, Iowa.
- TENNESSEE VALLEY CHAPTER, KNOXVILLE, TENN.:** Secretary, H. A. Garrett, 1215 Grand Ave., Knoxville, Tenn.
- TOLEDO CHAPTER, TOLEDO, OHIO:** Meets 2nd Wednesday. President, H. C. Benington; Secretary, C. N. Borden, 1654 Cone St., Toledo, Ohio.
- TRI-COUNTY CHAPTER, AURORA, ILL.:** Meets 1st Friday. President, W. Metcalf; Secretary, M. P. Reichenbacher, 448 South Ave., Aurora, Ill.
- TRI-STATE CHAPTER, HUNTINGTON, W. VA.:** Meets 1st Monday. President, A. W. Gruber; Secretary, A. W. Albertsen, 206—8th Ave., W., Huntington, W. Va.
- TWIN CITIES CHAPTER, MINNESOTA:** Meets 2nd Tuesday at Midway Y. M. C. A. President, Wm. Warner; Secretary, W. E. Gieb, P. O. Box 3332, St. Paul, Minn.
- VULCAN CHAPTER, BIRMINGHAM, ALA.:** President, Sandy Nelson; Secretary, E. D. Gothberg, R. 2, Box 225A, Birmingham, Ala.
- WESTERN MASSACHUSETTS CHAPTER, SPRINGFIELD, MASS.:** Meets 2nd and 4th Wednesdays. President, F. J. Kasper; Secretary, H. C. Lambert, 31 Elm St., Springfield, Mass.
- WICHITA CHAPTER, WICHITA, KANSAS:** Meets 1st and 3rd Fridays at Kansas Gas & Elec. Co. Bldg. President, F. W. Ryan; Secretary, F. H. Richards, 706 Pattie, Wichita, Kansas.
- WINNIPEG CHAPTER, WINNIPEG, MAN., CAN.:** President, J. B. Shepherd, 494 Clifton St., Winnipeg, Man., Can.
- WYOMING VALLEY CHAPTER, WILKES-BARRE, PA.:** President, F. M. Schultz; Secretary, E. E. Swank, 113 Lee Park Ave., Wilkes-Barre, Pa.
- YOUNGSTOWN CHAPTER, YOUNGSTOWN, OHIO:** President, M. Bokesch, Sr.; Secretary, M. W. Bokesch, Jr., 2328 Mahoning Ave., Youngstown, Ohio.

## 6th R.S.E.S. Convention to Be Held in Chicago—January 15-18, 1940

Board of Directors change dates and place. Convention to be held in conjunction with All-Industry Refrigeration and Air Conditioning Exhibit.

NEGOTIATIONS have been completed for the holding of the 6th Annual Convention of the R.S.E.S. in Chicago—January 15-18, 1940—from the dates originally announced as St. Louis in November, 1939.

In announcing this change in the time and place, the Board of Directors has acted in the interests of the Society to provide for the largest convention of the R.S.E.S. ever held and to afford the membership an opportunity of attending the most diversified exhibit of refrigeration equipment and accessories ever displayed under one roof.

The R.S.E.S. convention will be held in conjunction with the All-Industry Refrigeration and Air Conditioning exhibit sponsored by the Refrigeration Equipment Manufacturers Association. Well over 100 exhibitors comprising the leading factors in the industry are expected to provide a most valuable educational exhibit of refrigeration products. Particularly interesting will be

the introduction at this exhibit of new products developed by the manufacturers for the ensuing year.

In view of the extent of the displays which represent such an important part of the educational program of the R.S.E.S. convention, the Board of Directors, cooperating with the Refrigeration Equipment Manufacturers Association, has determined that the inter-



# THAWZONE

## Successful Field Results at Low Cost

**T**HAWZONE treatment is routine with some of the largest and best known users of refrigeration from coast to coast. THAWZONE is charged into new units by nationally known condensing unit and cabinet manufacturers. THAWZONE is a preventive and a cure.

Whether it is bought in lots of 10 gallons or by the 1 ounce bottle, the reasons are the same:

1. It has successfully proven itself over a period of 2 years.
2. It goes to the **root** of the moisture problem.
3. Its cost is amazingly low (note figure below).

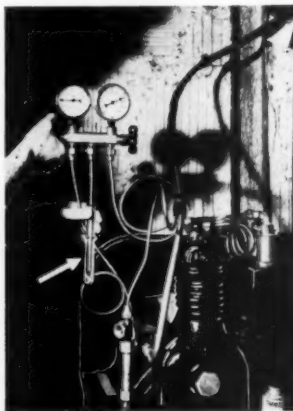
THAWZONE'S position is unique. Not only is it the **pioneer** fluid dehydrant but it stands alone, because only **THAWZONE DESTROYS BOTH MOISTURE and ACID**. Briefly, it re-

acts with water and acid, forming harmless products and making the system chemically **DRY and NEUTRAL**. Every engineer knows that a neutral, dry system cannot "copper-plate" or freeze-up.

Try THAWZONE yourself. Get it from your jobber or write us. Also distributed in the U. S. and Canada by Virginia Smelting Company.



The popular 4-oz. size treats 32 lbs. of refrigerant.



(Note the small quantity used)  
**To Cure Moisture Troubles or Freeze-ups:**  $\frac{1}{8}$  of an ounce per lb. of refrigerant in liquid line or evaporator.

**To Prevent Trouble:**  
Same dose in crankcase of new or reconditioned units.

Cost of treating a  $\frac{1}{2}$  HP system—47c.

---

**HIGHSIDE CHEMICALS COMPANY**  
**Newark, New Jersey**

---

est of our members can be best served by this change in convention dates.

The exhibition and convention will be held January 15 to 18—Monday, Tuesday, Wednesday and Thursday. As in the past, the R.S.E.S. convention program will occupy the first three days, with educational and business sessions extending over each morning and early afternoon. According to present plans exhibits will remain open during Monday and Wednesday evening, allowing ample opportunity for close inspection of the exhibits in the evening as well as during the day.

The R.S.E.S. annual banquet will be held in conjunction with the All-Industry ban-

quet tentatively scheduled for Tuesday evening.

Although the R.S.E.S. convention occupies the early part of three days, the exhibition will remain open on Thursday, so that a full additional day will be provided for final inspection of the exhibits. The exhibit will be held in the Exhibition Hall of the Stevens Hotel.

Convention committees will be announced shortly and will lay out plans for this important event.

Remember the dates—*6th Annual Convention—Chicago, Ill.—January 15 to 18, 1930—Stevens Hotel.*

## Four New Chapters Formed

### MONUMENTAL CHAPTER, BALTIMORE, MD.

ON Wednesday, March 8th, a group of refrigeration service engineers met to discuss the formation of a local Chapter. Mr. E. J. Uthoff of Washington, D. C., was one of the principal speakers and outlined the aims and objects of the National Society. In addition to Mr. Uthoff, Mr. Francis F. House, a member of Western Massachusetts Chapter, assisted in answering numerous questions.

After the discussion it was decided to form a chapter, and temporary officers selected until the receipt of the charter were as follows: *President*, H. H. Gibbons; *Vice-president*, G. J. Roche; *Treasurer*, Harry Goodhart; *Secretary*, Herbert Frame.

At a meeting held on March 31st the name of Monumental Chapter was selected. It was decided to hold temporary meetings at 1093 Cathedral St. until other arrangements can be made.

Mr. E. E. Starkey was elected chairman of the Educational Committee, and requested that Messrs. J. W. Mattheis, J. B. Ottenheimer, H. O. Makosky and W. E. Zimmerman serve on the committee with him.

The list of charter members of this Chapter includes:

A. M. Aaron	H. G. Miller
F. G. Baldwin	L. L. Neff
R. E. Bruce	J. B. Ottenheimer
M. H. Buschman	A. V. Risso

J. S. Button, Jr.	G. J. Roche
H. S. Eklof	H. H. Salley
W. V. Fitzgerald	J. Scherr
W. E. Fogle	G. A. Snelling
H. Frame	O. L. Snelling
H. H. Gibbons	F. W. Spath
J. F. Gladden	E. E. Starkey
F. W. Goodhart, Jr.	R. E. Storm
H. W. Goodhart	W. C. Sutton
G. E. Hanna	H. R. Welkner
J. L. Hopkins	B. White
L. Hornstein	C. A. Zang
H. O. Makosky	W. F. Zimmerman
J. W. Mattheis	

§ § §

### SIoux CITY CHAPTER SIoux CITY, IOWA

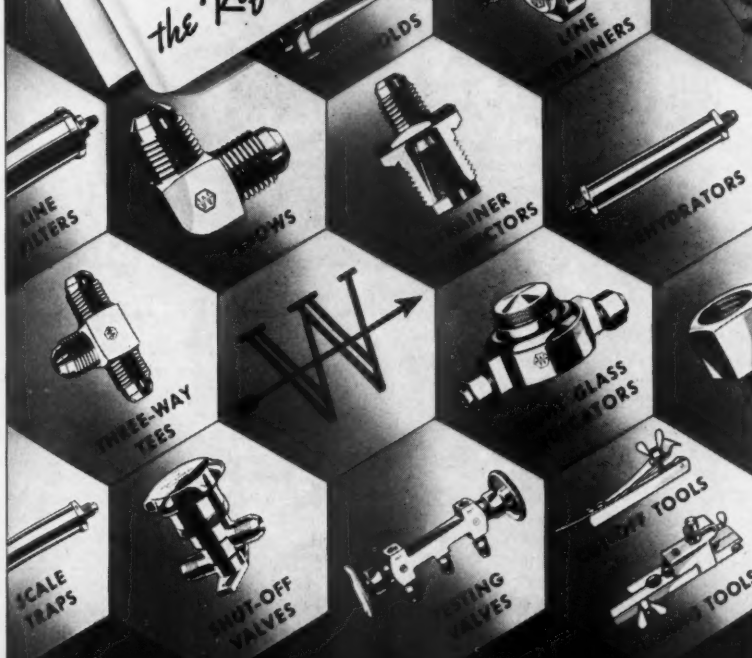
A group of service men met on March 17th, at which meeting National Treasurer S. A. Leitner of Kansas City was present, to discuss the formation of a local chapter of the R. S. E. S. An interesting meeting was held and immediate plans made for the formation of this chapter.

The temporary officers selected for the Chapter until the charter is presented are as follows: *President*, Frank Kutil; *Treasurer*, M. Mosier; *Secretary*, N. Lynum.

The charter members include:

P. Abelson	W. P. Mahrt
J. F. Bartow	J. A. McCarthy
G. Benoit	J. W. McCarthy
A. V. Browning	E. A. Meyer
S. DeMots	M. L. Mosier
H. R. Eriksen	A. P. Orth
J. L. Jarvis	A. L. Ricard

**COMPLETE**  
*Fitting and Valve Service for  
 the Refrigeration Engineer*



Weatherhead valves and fittings are  
 stocked by leading jobbers everywhere.

**THE WEATHERHEAD CO.**

CLEVELAND, OHIO

C. D. Kutil  
F. Kutil  
M. G. Lane  
H. Luth  
N. Lynum  
P. J. Mahoney

A. L. Robertson  
W. A. Ross  
L. Slowey  
B. Swensen  
W. B. Whyte

Mr. C. W. Dennis of the Dennis Refrigeration Supply Co. assisted in the formation of both the Tall Corn and Sioux City Chapters by sending the notices calling for the meetings, as well as providing the meeting places for the group meetings.

§ § §

#### TENNESSEE VALLEY CHAPTER KNOXVILLE, TENN.

Through the cooperation of Mr. M. W. Leitner in Knoxville, Tenn., a group of service men met on March 8th, at which President Claude A. Brunton of Huntington, W. Va., was present to outline the purposes and objects of the Society and to suggest the formation of a local Chapter.

At a subsequent meeting, further plans were discussed, and the following officers were selected to serve temporarily until receipt of the charter: *President*, W. C. McConnell; *Secretary*, H. A. Garrett.

The charter is being held open to include the names of as many service men in Knoxville and surrounding territory as desire to participate as charter members.

Additional information concerning future meetings of the Tennessee Valley Chapter can be secured from Secretary H. A. Garrett, 1215 Grand Ave., Knoxville, Tenn.

§ § §

#### TALL CORN CHAPTER CEDAR RAPIDS, IOWA

On March 16th, National Treasurer S. A. Leitner of Kansas City, attended a meeting of service engineers from Cedar Rapids and surrounding territory, and Tall Corn Chapter was formed with the following to serve as temporary officers until the receipt of the charter: *President*, R. R. Koepsell; *Secretary*, H. H. Ulish, *Treasurer*, Ralph Martin, Sr.

The following members are the charter members of this new organization:

R. W. Bond	R. Martin, Sr.
M. C. Grant	B. F. McLain
L. Hess	A. Nissen
W. Hunter	R. L. Novak
G. Kennedy	F. L. Pech
E. E. Kenyon	G. Secor
R. R. Koepsell	R. F. Tracy
M. A. Leoni	H. H. Ulish
R. Martin, Jr.	F. E. Wooldridge

#### YEAR BOOK NEAR COMPLETION

THE Refrigeration Service Engineers Society Second Annual Year Book is now in its final stages of preparation and it is expected that it will go to press within the next two weeks. Members of the Society and non-members who have placed their orders for copies will receive them in the mails immediately upon receipt from the printer.

This edition of the Year Book contains such useful information as the following:

Oil and Refrigerant Data for Household Refrigerators.

Temperature Pressure Relation Tables on More Than Twelve Popular Refrigerants.

Pressure and Temperature Settings for Various Applications of Refrigerating Equipment.

Reference Material in the Form of Articles Which Should Be Preserved for Future Use.

There are many other interesting features of this book and you will find it a worthwhile contribution to the educational efforts of the Society.

§ § §

#### MILE HIGH CHAPTER

THE best meeting in the history of the Mile High Chapter was held in Denver, Colorado, on April 12th. All the members and a large attendance of non-members were present, many of whom drove as far as 300 miles to the meeting.

The program for the evening was both entertaining and educational and started with a moving picture presented by Mr. Robert B. Kinkead, assistant district traffic manager of the United Airlines. Mr. Kinkead gave an interesting and informative talk along with the picture.

Following this feature an accordion solo was given by Mr. Tibbs, and was later accompanied by Mr. Eddie Carver, the state accordionist champion. Several selections were given by both.

Next on the program was a tube bending contest with the following service men competing: Tom Montgomery, Albert Ward, Ernest Martin, James O'Connell, Frank O'Connell, Chester Killiam, Wilbur Bowman and William Steininger.

Everyone, including the contestants, was very much enthused about the contest and enjoyed it very much.

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REG. U.S. PAT. OFF.

High Purity  
and Dryness

Dependable  
Service

Coast-to-Coast  
Distribution

*The Preferred METHYL CHLORIDE for Service Work*



E. I. DU PONT DE NEMOURS & COMPANY, INC.  
The R. & H. Chemicals Department  
Wilmington, Delaware

District Sales Offices: Baltimore, Boston, Charlotte, Chicago, Cleveland,  
Kansas City, Newark, New York, Philadelphia, Pittsburgh, San Francisco

### WINNERS OF THE CONTEST

Name	Time	Prize	Donor of Prize
1st—Albert Ward .....	17:15	No. 32 Imperial Hi-Duty Sol- dering & Brazing Outfit...	Refrigeration Parts & Supply Co., Denver.
2nd—James O'Connel .....	24:40	No. 23G2 Ranco Control....	Ranco, Inc., Columbus, O.
3rd—Wilbur Bowman .....	25:20	2 Syntron Seals.....	Syntron Co., Homer City, Pa.
4th—Wm. Steininger .....	26:00	Rotex Ash Tray.....	Rotary Seal Co., Chicago.
5th—Frank O'Connel .....	26:39	Rotex Ash Tray.....	Rotary Seal Co., Chicago.
6th—Tom Montgomery .....	10:02	Rotex Ash Tray.....	Rotary Seal Co., Chicago.
7th—Chester Killiam .....	27:00	Rotex Ash Tray.....	Rotary Seal Co., Chicago.
8th—Ernest Martin .....	.....	On-Me Game .....	Imperial Brass Mfg. Co., Chicago.



The Three Gentlemen at the Left Are the First Three Prize Winners of the Contest. The Contestant in the Right Hand Picture Is Being Revived by His Trainers After the Contest Was Over

Other prizes were given as follows: One Autodex donated by the Rotary Seal Co. given on a drawing for the ladies. One Autodex donated by the Rotary Seal Co., given as a door prize on a drawing. One 50-foot roll of tubing, donated by the Wolverine Tube Co., given to the tallest man in attendance, and one roll of tubing to the shortest man. One Gates car mat, donated by the Gates Rubber Co. of Denver, was given as a prize on a drawing; and one Emerson radio, donated by the Auto Equipment Co. of Denver, was also given away as a door prize.

The judges of the contest were Mr. Frank Ludwig of the Grauman Co., Mr. Burbank of the Public Service Co., and Mr. Brown of the Frigidaire Corp. The timekeeper was Mr. C. R. Anderson of the Auto Equipment Co.

\$\$\$

### IT'S TRUE—ISN'T IT, HERMAN?

FROM authoritative sources, which we have every reason to believe are reliable, we learn that the popular and well-known "bon vivant" Herman Goldberg of Chicago has entered the ranks of the benedicts.



HERMAN GOLDBERG

Herman enjoys a wide acquaintanceship throughout the industry as a manufacturers' representative of principal refrigeration supplies and equipment, as well as through his active work in the R.S.E.S.

As this issue goes to press our informant advises us that the ceremony was performed on May 7th in Chicago. Some details are lacking as to the name of the lucky girl and the location of the honeymoon, but undoubt-

## Now You Can Own A Compact-Portable RECORDING THERMOMETER of MARSH quality

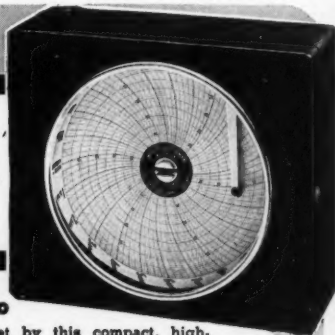
for only \$18.50 F.O.B. Chicago

• One of your greatest needs is met by this compact, high-quality recording thermometer. It is small—only 5" x 6" x 2 1/4"—and extremely light—weighs less than two lbs.—yet it gives an accurate, easily read 24-hour chart of the temperature range. Contains a sensitive, rugged thermometer element and an accurate, adjustable clock movement. New type of pen assures a sharp, legible graph. Handsomely finished in satin black with bright, chromium bezel. The price includes the instrument packed in a durable container complete with 50 charts, bottle of ink, and dropper. A handy leatherette carrying case with space for extra charts and ink, is furnished for only \$1.50. Available in the following ranges: —20 to +25° F., 0 to +45° F., +15 to +60° F., +45 to +90° F., +20 to +110° F. Also Centigrade.

Write  
for new  
circular

JAS. P. MARSH CORP. 2059 Southport Ave., Chicago

# MARSH Refrigeration Instruments





edly we will see these facts recorded soon in Herman's rapidly expanding library of colored movies.

We know, Herman, that we bespeak the sincere sentiments of a host of your friends in wishing you and Mrs. Goldberg a long and happy future.

\*\*\*

## MICHIANA CHAPTER RECEIVES CHARTER

**TWENTY-EIGHT** members of Michiana Chapter attending a banquet on April 10th were presented with the charter for the Chapter by National Director, Willis Stafford of Aurora, Ill. Attending also with Mr. Stafford was Mr. E. White of Elgin, Ill. A general discussion as to the future activities of the Chapter featured the meeting.

A representative of the South Bend Tribune gave an interesting talk.

The officers of this Chapter include: *President*, J. A. Pechi; *1st Vice-president*, R. K. Gill; *2nd Vice-president*, T. L. Driskell; *Treasurer*, E. E. Ullery; *Secretary*, Leo McKee.

## PITTSBURGH CHAPTER CONTEST

**A** TUBE bending contest for members and friends of the Pittsburgh Chapter was held April 11, in the Jos. Woodwell Company Service Department. Mr. John Allman of the Imperial Brass Company, sponsors of the contest, explained the rules of the contest to the ten men participating. At the conclusion of his talk the material, fittings, and blue prints were distributed and the contestants went to work. The champion bender, Mr. Elmer Hunyady, turned in a fine piece of work in the elapsed time—31½ min., second was John Kirch, whose time was 32 min., and third place, John Wally, time was 32½ min. Valuable prizes of Imperial Tools were awarded to the winners and a special consolation prize of an Imperial Hi-lo gauge set was awarded John Barbagallo with the suggestion that he purchase a new rule which does not contain the metric scale. Mr. Barbagallo again made the mistake of working out his project on the metric scale instead of the inch scale as required, and although he completed it

# Snap-on

**SPECIALIZED TOOLS  
FOR REFRIGERATION SERVICE**

When nuts are close together—when bolts protrude—whenever you're in a "tight corner" and need speed—these slim-shanked, Dwarf Boxockets save valuable time—do better work. The thin-walled Boxocket head slips in most anywhere—the offset handle passes most any obstruction. And the six-point Boxocket grip on the nut multiplies turning power—gives you safe, non-slip leverage with only 30° handle movement. Snap-on Dwarf Boxockets are made in 12 nut sizes

—2 sizes per handle—covering the entire range of refrigeration requirements from ⅜" to 1⅜".

**Time-Savers  
in Tight  
Places!**

See Snap-on Tools in your telephone directory—or write for catalog.

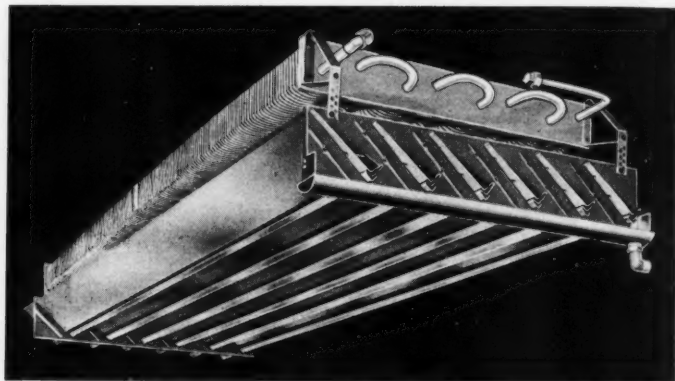
**SNAP-ON TOOLS CORP.**  
Dept. RSE-5, Kenosha, Wis.



**Snap-on**  
Socket Wrenches

*The Choice of  
Better Mechanics*

**Blue-Point**  
Mechanic Tools



## TRIPLE TROUGH Cooler

by **KRAMER** "Years in Advance"

TRENTON AUTO RADIATOR WORKS

**25<sup>th</sup>**  
Anniversary

Trenton, N. J.

at 19 min. he was disqualified.

The prizes were donated by the following Pittsburgh distributors: Jos. Woodwell Co., Williams & Co., William Orr Co., and Melchior Armstrong Dessau Co. Judges of the contest were John Allman, S. A. Ricci, and F. V. Golitz. At the conclusion of the contest Mr. Allman called on the following men for brief remarks: A. H. Hoerner, C. V. Hale, "Red" Laderer, N. Scully, and P. T. McCormack who introduced Mr. Lynch, manager of the Jos. Woodwell Co. Mr. Lynch gave a brief outline of the company's history and services. Lunch and refreshments were served to the assembly.

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### ROCKFORD AUXILIARY

THE wives of the members of the Rockford Chapter, held their first meeting on April 3, at which time temporary officers were appointed. It was then decided to hold a second meeting on April 17, when permanent officers for the year were elected, as follows:

President—Mrs. Walter Larson.

Vice-President—Mrs. R. C. McCarthy.

Secretary—Mrs. Earl Seaton.

Treasurer—Mrs. Leslie Sturch.

Publicity Chairman—Mrs. R. C. McCarthy.  
Membership Chairman—Mrs. Arthur Overman.

Investigating Chairman—Mrs. Joseph McGinnis.

Board of Directors—Mrs. Arthur Overman, Mrs. Don Vandenberg, Mrs. Don McCausland.

Those elected accepted their respective offices and the meeting was continued.

Motion was made and seconded to hold their meetings the first and third Mondays at 8:00 P.M. of each month at the Hotel Nelson.

After discussion of the individual ideas presented by the ladies regarding the activities of the Auxiliary the business meeting was adjourned.

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### TRI-STATE FISH FRY HELD

THE Tri-State Chapter held a dinner April 20th. The dinner was planned by the committee: Mr. Ben DeRoud, Chair-

# 5 EASY STEPS TO PEAK VALVE PERFORMANCE

**1**



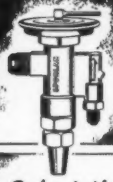
**See YOUR JOBBER**

**2**



**Ask him for the New 1939 SPORLAN CATALOG**

**3**



**Select the SPORLAN THERMOSTATIC EXPANSION VALVE THAT HAS THE proper charge for your job**

**4**



**Notice that the Sporlan Valve you buy is sealed in the new black and white Sporlan container especially for your protection.**

**5**

*Then install*

the valve on your job and forget it ...for you can be confident that **SPORLAN CONTROLLED PERFORMANCE VALVES** will give you Peak Performance on all installations

**SPOEHRER-LANGE COMPANY**  
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man; Mr. Claude Brunton and Mr. A. W. Albertson. Also the ladies entertainment Chairlady, Mrs. A. W. Albertson. The fish for the dinner was furnished by the Ansul Chemical Company.

After the dinner the early part of the evening was spent in dancing and followed by playing games, such as Chinese checkers and Bingo.

The evening was enjoyed by all and everyone expressed their appreciation of the fine fish, and offered their thanks to Ansul Chemical Company.

## Chapter Notes

Under this heading will appear news of the chapter meetings. For names of the officers and dates of regular meeting nights, please refer to the Chapter Directory.

### TWIN CITIES CHAPTER

April 11—It was announced that Mr. Otto Kroeberger, secretary of the chapter, had moved to another city and it therefore became necessary to select a new secretary to serve for the balance of the year. Given the power to do so by the chapter, Presi-

dent Wm. Warner appointed Mr. W. E. Gleb to this position.

An announcement concerning the April 17th meeting was made in which it was stated that the Detroit Lubricator Co. would have a representative present.

On the educational program for the evening Mr. Chas. E. Tupper, chairman of the Educational Committee, gave an interesting lecture on the National Lecture Course, No. 5. This bulletin, however, was not completed and it will be continued at the next regular meeting.

### PITTSBURGH CHAPTER

April 14—Mr. E. V. Black, president, opened the meeting, and the business of the evening was quickly dispensed with. The proposed refrigeration and air conditioning code as compiled by the Bureau of Building Inspection was discussed at some length.

The Secretary was instructed to contact Mr. Seaman of the Bureau for further details of the code.

Mr. Elmer Hunyady of the Standard Refrigeration Co. was then introduced and he lectured on and demonstrated the new Standard thermostatic expansion valve developed by him and which employs many new features over present makes. The demonstration and lecture were very interesting and instructive.

### CENTRAL INDIANA CHAPTER

*April 14*—The meeting was called to order by Secretary Vern Nold in the absence of the President. There was not much business to be done for the evening and therefore the business session was soon dispensed with.

The meeting was then turned over to the Chairman of the Educational Committee, who provided a very instructive evening on the subject of Grunow compressors.

Mr. Ernest Hussong of Marion, Ind. was admitted into the chapter as a new member at this meeting. Mr. Hussong was cordially welcomed.

*April 18*—The meeting was called to order by Vice-President Wm. Sevy and the meeting was held in the home of Herbert Hale in Kokomo, Ind. Snow and rain prevented many of the members from attending this meeting but for those who were present it proved to be a very profitable meeting.

The educational program of the evening consisted of a reading by Mr. Paul Jacobsen of a very interesting article from a trade publication.

Following this, considerable time was devoted to the answering of questions contained in the Question Box, and as usual

this feature created considerable interest.

The meeting finally adjourned to the kitchen where refreshments were served and Mr. Herbert Hale was given a vote of thanks for the fine sandwiches supplied.

### LONG BEACH CHAPTER

*April 6*—The meeting was held in the offices of the Willis Refrigeration Service and was presided over by President E. B. Gunsauls.

The guest speaker of the evening was Mr. Jarvis, and he was introduced to the chapter by the President. Mr. Jarvis gave an interesting educational talk on the development of the new line of Record coils by Refrigeration Engineering, Inc., of Los Angeles. Following his talk, Mr. Jarvis distributed among the membership new catalogs containing valuable data for the refrigeration service engineer.

### WICHITA CHAPTER

*March 27*—After the business of the evening was dispensed with, the balance of the evening was devoted entirely to the offerings of the Detroit Lubricator Co. Represent-

## Try this New, More Efficient CORK AND RUBBER INSULATION



● Looking for a more efficient cold line insulating material offering all the advantages of rubber and none of its disadvantages? Then you will want to investigate Miller's new cork and rubber combination. It is long lived; has excellent insulating qualities; can be made into any shape; possesses great flexibility; and does not absorb moisture.

Ask your local jobber for a sample of this new cork and rubber insulating material. If he cannot supply you, write direct to

**MILLER RUBBER COMPANY, INC., AKRON, OHIO**



**Miller**

**"Engineers in Rubber"**



ing the company were Mr. M. M. Rivard of Kansas City and Mr. Thomas McKee, Jr. Among other things these two gentlemen presented for the evening was a sound film on the subject of thermal expansion valves, which was found to be very interesting and instructive.

Also, Mr. McKee gave a blackboard demonstration and talk on the controls manufactured by his company. Many questions were asked of these two gentlemen and were thoroughly answered through the use of the black board by Mr. McKee.

*April 7*—As usual, the meeting was held in the Kansas Gas and Electric Office Bldg., and was presided over by President F. W. Ryan. The business of the evening was made as short as possible so that a greater amount of time could be given to the educational program.

On this program Mr. G. B. Govits, chairman of the Educational Committee, introduced the speaker of the evening, Mr. L. Kraus of the Minneapolis-Honeywell Regulator Co. Mr. Kraus gave a complete and interesting discussion and demonstration of

the Polartron system, after which an informal discussion in which everybody participated was conducted on the subject of these controls.

Mr. Harold Schick, also of the Minneapolis-Honeywell Regulator Co., was a welcome visitor for the evening.

#### MADISON CHAPTER

*March 28*—There were two visitors present for the evening, who were introduced to the chapter—Mr. Richard Maultpress and Mr. J. C. Bixby.

The educational feature of the evening was a Quiz Contest, with two opposing teams. The two visitors of the evening were chosen as captains, and after a hot and interesting battle Mr. Bixby's team won with 159 points against 152 for Mr. Maultpress's team. Mr. Ed. King won the individual prize for the greatest number of points.

The meeting was then turned over to Mr. Kirkland of the Mueller Brass Co., who gave a talk on some of the new things to be found in the field. Mr. Kirkland ended his talk by demonstrating methods of putting together stream line fittings.

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Parts and Sup-  
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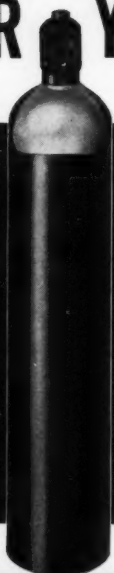
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**ANSUL CHEMICAL**

**COMPANY**

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Refreshments at the expense of Mr. Kirkland were served following the meeting.

## MONTGOMERY CHAPTER

*April 6*—With the high enthusiasm attained in these meetings it is not difficult to spend an entire meeting on general discussions of problems concerning the members. Therefore, following the practice of the last two meetings, round-table discussions again occupied the major part of the evening.

An announcement was made of the intention of one of the refrigeration parts jobbers in the locality to hold a special meeting on April 12. It was anticipated that a good time will be had by all and that a large turnout will be present.

*April 12*—This meeting was sponsored by the Teague Hardware Co., which undertook to supply an entire afternoon and evening's entertainment. Several manufacturers' representatives were present, who gave interesting accounts of their products in conjunction with the display of the Teague Hardware Co.

During the evening's program, Mr. Milo Howard—a member of the chapter—gave an interesting talk, after which representatives of the Gates Belt Co. and the Fedders Mfg. Co. provided some useful information.

A large number of visitors and non-members were present in addition to the regular

members, many of whom were from out of town. For the benefit of these visitors, the Vice-President of the Chapter gave a lengthy description of the purposes and objects and the aims of the Society.

*April 20*—Only a part of this evening was devoted to the Chapter meeting and during this time the business of the evening was dispensed with as quickly as possible.

The remainder of the evening was devoted to a fish fry held at the Rainbow Inn on Birmingham Highway, at which all members, their wives and sweethearts were present. The food was much enjoyed by all attending, and the evening proved a pleasant and enjoyable one.

## MISSISSIPPI VALLEY CHAPTER

*March 24*—After the regular business of the Chapter was dispensed with, the meeting was turned over to the Educational Committee, and Mr. J. Page of the Detroit Lubricator Co. was introduced for the purpose of presenting a few remarks regarding their products and method of distribution. This information, although somewhat general and different from the average type required of a manufacturer, was very much appreciated by all present.

*April 14*—Announcement was made that Mr. C. E. Johnson of Peerless of America, Inc., would be the speaker on the educa-



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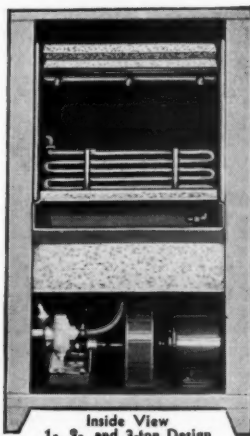
For greatest operating economy investigate these outstanding Marlo features:

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3. Positive water circulation; water outlets provided from pump for compressor head.
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6. Quiet, designed to operate with minimum vibration and sound.

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tional program at the meeting of April 28th and that he would present a new color film on Peerless products.

After some discussion, it was decided that beginning with the month of May the Chapter would hold meetings only once a month for the duration of the summer and that these meetings would be on the second Friday of each month.

### MISSOURI VALLEY CHAPTER

March 16—Mr. Bob Young of the Mueller Brass Co. Kansas City office was introduced as the guest speaker of the evening. Mr. Young gave an interesting talk, touching on various points of interest to the refrigeration service engineer. Among these was general information regarding refrigeration codes, followed by a showing of cut-away samples of products manufactured by his company.

During the course of the business session of the evening, President F. C. Haerberlein urged that caution be exercised in the handling of Freon-12 the same as with any other refrigerant. Mr. Haerberlein pointed out that in spite of the non-toxicity characteristics of the gas, decomposition under certain conditions was possible and that the products of this decomposition are toxic compounds.

Mr. Bob Young, following this line of

thought, cautioned the members in the use of carbon tetrachloride with particular emphasis where the liquid may come in contact with the bare hands, because of the reported cases of kidney disorders through such contact.

It was suggested that the Chapter endeavor to secure the services of Mr. S. A. Leitner, our regional director, as a means of getting information on refrigeration codes. Mr. Bob Young made an offer to take a special trip to Kansas City in order to return with Mr. Leitner.

### ROCKFORD CHAPTER

April 3—The meeting was opened by President R. C. McCarthy, and the first order of business for the evening was the drawing for the attendance prize. The name of Mr. L. L. Sturch was drawn but because he was not present the amount was allowed to accumulate until the next meeting.

President McCarthy announced the death of Peter Sorensen of DeKalb, Ill., and the Chapter voted to send their sympathies and regrets, as well as flowers, to his immediate family.

This meeting was held in conjunction with the ladies for the purpose of forming a Ladies' Auxiliary. President McCarthy gave a short talk outlining the purposes of the Auxiliary and read the constitution and by-

laws as set forth by the National Auxiliary.

Later in the evening the meeting was turned over to Mrs. W. Larson, temporary chairlady of the Auxiliary.

#### KANSAS CITY CHAPTER

*March 28*—Announcement was made of the forthcoming dinner dance to be held in connection with the installation of officers of the Ladies' Auxiliary, probably some time in the near future.

Mr. Thompson gave a report of the work done to date on price standards and asked for the cooperation and suggestion of the members.

The meeting was then turned over to the chairman of the Educational Committee, and Mr. H. F. Andrews and Mr. C. L. Hataway gave a very nice talk which was much enjoyed by the members.

*April 25*—The meeting was called to order by President J. P. DeWilde.

The Chairman of the Educational Committee, Mr. Andrews, announced that at the next meeting of May 9th, the Imperial Brass Co. would conduct a tube bending contest and that on May 6th a dinner dance and card party would be held at which time the Ladies' Auxiliary would hold their installation of officers. All members were urged to be present for both these gatherings.

Mr. E. L. Tramposh of the Refrigeration

Equipment Co., a member of the Chapter, was then introduced and gave a very complete talk on the new type valve just placed on the market.

Mr. L. H. Roberts of the Forslund Pump and Machinery Co. also discussed at some length a new blower type coil.

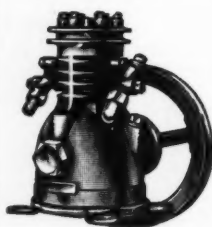
#### ST. LOUIS CHAPTER

*March 23*—On the educational program of the evening, Chairman E. Gyax introduced Mr. Marc C. Shantz of the Fedders Mfg. Co., who gave a very comprehensive story on their line of refrigeration products. Everyone present was supplied with the latest Fedders catalog, together with the most recent issue of Fedders news.

A question and answer period concluded the educational feature.

*April 13*—Immediately after the meeting was called to order by President A. H. Huhn, it was turned over to the Educational Chairman, Mr. E. Gyax, who in turn introduced Mr. R. W. (Bob) Cook of Ranco, Inc. After a most interesting illustrated lecture of a trip through the Ranco plant, Mr. Cook proceeded to explain in detail the complete line of controls manufactured by his company. Questions and answers followed the talk and were thoroughly answered by Mr. Cook.

Some discussion followed concerning the



### "Chieftain" Quality Built Compressors and Condensing Units



are designed to give you many years of quiet, efficient and trouble free service by Engineers who have been serving the refrigeration industry for the last fourteen years.

They have again "scored a hit" with a new "V" type four cylinder compressor which is designed for use with  $\frac{1}{2}$  to 1 HP motors. All of the advanced features that have proven so successful in "Chieftain" household and light commercial units are now incorporated in this new four cylinder model.

Mechanical improvements include, force feed lubrication to piston pin and connecting rod bearings, positive alignment of cylinder bores with main bearings by casting cylinders and crankcase in one piece. Adjustable suction shut-off valve, interchangeable parts with single and twin cylinder models. All compressor parts are machined to precision limits on up to date equipment and assembled in glass enclosed rooms where only filtered, dust free air is admitted.

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tube bending contest to be held at the next meeting and Mr. Huhn exhibited a sample project which would be used by the judges in deciding the winner. He explained that in addition to prizes for the winners of the contest, there would be an equal number of attendance prizes. Ladies and guests are also to be invited.

#### ILLINOIS VALLEY CHAPTER

*March*—During a meeting held in this month, the greater part of the time was taken with the election of new officers to serve for the balance of the present year. The election was conducted in the usual manner and the results were as follows: *President*, A. D. McGill; *1st Vice-president*, C. Rowley; *2nd Vice-president*, W. Davidson; *Secretary*, R. Davidson; *Treasurer*, D. Reynolds; *Sergeant-at-arms*, S. Goble; *Educational Committee Chairman*, G. Dresback.

#### TOLEDO CHAPTER

*April 12*—President H. C. Benington called the meeting to order and immediately proceeded with the business routine of the evening.

Among the committee reports received was that of Mr. La Fayette who stated that all was in readiness for the forthcoming fish fry.

Mr. Gill Harris of the Frigidaire Corp.

gave a highly educational talk on the subject of "Heat Transfer," which was very much enjoyed.

§ § §

#### CRISLER WINS OKLAHOMA TUBE BENDING CONTEST

BY completing the contest project in a net time of 19 minutes, A. B. Crisler of Refrigeration Sales and Engineering Co.,



Left—A. B. Crisler, Refrigeration Sales & Engineering Co., Oklahoma City, first prize winner of tube bending contest

Right—Jack Pim, General Electrical Supply Corp., Oklahoma City, second prize winner of tube bending contest

# HERVEEN



## Thank You, Service Men!

In the April issue of R. S. E. we announced HERVEEN, the newly developed refrigerant specially designed for recharging Frigidaire Meter-Misers. We knew there was a need for this gas, but we didn't expect you'd go for it the way you did. Scores of service men are now making money on Meter-Miser jobs they used to pass up. If you haven't tried HERVEEN ask your jobber to supply you today.

### YOUR JOBBER

can get Herveen for you  
in 48 hours. Ask him for  
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## Here's the new HEALTHGUARD

A high quality "tool" for refrigerator service men . . . an emergency fume kit for handling those "quick" calls . . . and when you have this kit with you, it's worth its weight in gold. Handy, serviceable, safe! Keeps dangerous and irritating fumes out of eyes, throat and lungs. Keeps you feeling better. Comes in durable carrying case with interchangeable cartridges for ammonia, methyl chloride and sulphur dioxide. Satisfy yourself. Order your kit today.

## FUME KIT



**CHICAGO EYE SHIELD CO., 2341 Warren Blvd., Chicago, Ill.**

Oklahoma City, won the tube bending contest sponsored by Macklanburg Brass & Copper Products, Inc., wholesalers of refrigeration supplies, in Oklahoma City on March 15.

The contest was held in connection with the Macklanburg Brass and Copper Products Refrigeration and Air Conditioning Show and Convention at the Oklahoma Club. The combination show, convention and contest attracted widespread interest and an

excellent attendance of service engineers.

As first prize for winning the contest Mr. Crisler was awarded an Imperial No. 500-C Hi-Lo charging and testing unit.

Second place in the contest went to E. E. "Jack" Pim, General Electric Supply Corp., Oklahoma City, who was awarded an Imperial No. 174-F tube cutter. D. A. Billings, Billings Electric Co., Enid, Okla., won third place and received an Imperial No. 127-F junior tube cutter.



In the views from left to right are the following personalities. 1—C. S. Anderson (left) of The Imperial Brass Mfg. Co., explains the merits of a new Imperial copper tube manifold to C. S. McPherrin (right) of McPherrin Refrigeration Service Co., Guthrie, Okla.

2—C. E. Terry of Temprite Products Corp. presents the Temprite line to the convention

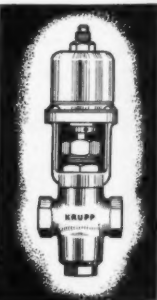
3—Chesley Rutledge and Chas. Belsky of the Belsky Butchers' Supply, Oklahoma City, in an interesting discussion with N. E. Jennison, Penn Electric Switch Co.

## KRUPP VALVES



Refrigeration experts who want to cash in on this big reward of customers' good will should investigate the high quality and dependability of KRUPP VALVES.

Not a newcomer, Cyrus Shank products have been the standard of the refrigeration industry for over 27 years—and they are built to meet today's needs. They save and make money by giving peak performance always. Write for prices on Water Regulator Valves, Dehydrators and Strainers and a copy of our new catalog just off the press. It is free for the asking.



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**THE BROWN CORP., 652 Bellevue Ave., SYRACUSE, N. Y.**

Judges of the contest were Professor E. F. Dawson, associate professor of mechanical engineering, University of Oklahoma, Norman, Okla., C. F. Bauer, acting chief engineer, Department of Justice, U. S. Southwestern Reformatory, El Reno, Okla., and C. T. Hudson, Mueller Brass Co.

The project and rules used in the contest were furnished by the Imperial Brass Mfg. Co., Chicago, as were the tubing and fittings used by the contestants.

### Gordon Lozier Winner at Omaha



Gordon Lozier

Finishing first in a field of eight contestants, Gordon Lozier, Gordon Refrigeration Co., was named the winner of a tube bending contest held recently in Omaha, Neb. The contest was designed along similar lines to the contest held at the national convention of the R.S.E.S. in Buffalo last fall, and was sponsored by Interstate Machinery & Supply Co., Omaha, Neb., wholesalers of refrigeration supplies.

Mr. Lozier completed the contest project in 18½ minutes. As first prize he was given an Imperial No. 500-C Hi-Lo Charging and Testing Unit by the Interstate company.

Second place in the contest went to Dan Benash, Acme Refrigeration Co., and third place to Stanley Welna, Welna Refrigeration Service.

The project used for the contest and all the fittings and tubing used by those participating were furnished by The Imperial Brass Mfg. Co., Chicago, and C. S. Anderson of this company was in attendance.

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## ANSUL'S "OSMERUS MORDAX"

"OSMERUS MORDAX"—or in the more common parlance of the day—smelts—were an enjoyable delicacy on many tables throughout the country during the past months.

The Ansul twins were at it again and got their share of the catch during the well known smelt run that occurs annually. Many chapters of the R. S. E. S. arranged fish fries as a special attraction of their meetings.

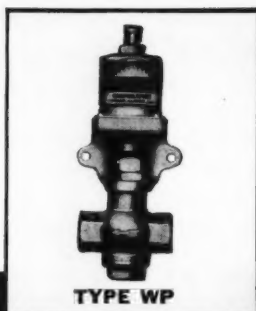
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$\frac{3}{8}$ ",  $\frac{1}{2}$ " &  $\frac{3}{4}$ " FPT SIZES

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150 lb. water or refrigerant press

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### "FERDINAND THE BULL"

ROTARY SEAL CO.'S "Ferdinand the Bull," so nicknamed by George P. Gilman, president of the company, will make its appearance in jobbers' stores very shortly. An attractive colored cut-out of a police officer will serve as a silent reminder that replacement seals for 115 units are available from the Rotary replacement seal list.



The cut-outs are supplied in 24-inch size for window and interior display, while eight-inch cut-outs will be used for counter displays. Also available will be eight-inch decalcomanias for store windows.

### COMPLETE IN NEW QUARTERS

THE Complete Refrigeration Service Company, formerly located at 1546 W. Glenlake Avenue, have recently moved to their new quarters at 3819 N. Ashland Ave., Chicago, Ill.

Mr. Oscar Heide, owner of the company, purchased as a permanent business location a one-story brick building with a total floor area of about 4500 square feet. He has completely remodeled and redecorated the building, dividing it into various departments convenient to his main classifications of work.

The front end of the building is taken up with a showroom on one side and an office on the other. The remainder of the building is divided into a repair shop, a stock room, a hot room and a spray and paint room.

The expanding volume of business done by the company in the repair of hermetic units, sales and service of commercials, and the sale of Westinghouse refrigerators, necessitated the larger quarters.

NOW TUBING CAN BE PINCHED IN 5 SECONDS

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**WISE-GRIP  
PINCH-OFF PLIERS**

Makes Pinch-Offs that are Gas Tight — Holds onto Tubing by Itself Until Released.

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REMPE CO., 340 N. Sacramento Blvd., Chicago  
Also stocked by Leo S. Bosarge Co., 315 Spring St. N.W., Atlanta, Ga.

### OPEN HOUSE PARTY FOR MILWAUKEE SERVICE MEN

LEE LA DUE, proprietor of the Refrigeration Specialties Co., 2041 W. Wells St., Milwaukee, Wis., recently conducted an open house party at his refrigeration parts supply store at which over 200 service men from Milwaukee and surrounding cities were in attendance.

A buffet luncheon and entertainment was provided in addition to product talks by representatives of manufacturing firms which included: Peerless of America, Penn Electric Switch Co., Cutler-Hammer Co., Dayton Rubber Co., Independent Rubber Co., Kerotest Mfg. Co., American Brass Co., Automatic Products Co., and Herman Goldberg representing Ranco, Inc., and Ansul Chemical Co.

continuance of the manufacture of Arco Air Filters as of May 1, 1939.

The machinery, equipment, and materials have all been sold to the Detroit Air Filter Company who will continue to manufacture the same type of air filter under the name "Detroit Air Filter" at 1330 West Congress Street, Chicago, Illinois.

The plant of the Detroit Air Filter Company will be under the supervision of Charles G. Lamb, former manager of the Arco Air Filter Plant. Mr. Lamb announces that the entire personnel of the former plant, which so ably assisted in the development of the Arco Air Filter, will be retained by the Detroit Air Filter Company.

The Detroit Lubricator Company, Detroit, Michigan, will be the sole distributors of Detroit Air Filters.

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### ARCO AIR FILTERS DISCONTINUED

THE American Radiator & Standard Sanitary Corporation announces the dis-

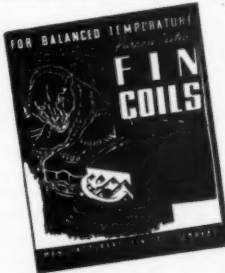
### CHICAGO SEAL LIST AVAILABLE

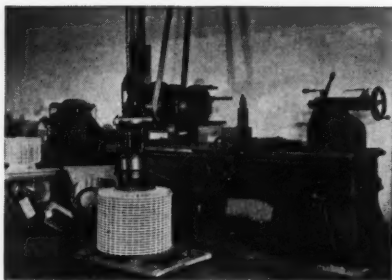
THE Chicago Seal Co., 20 No. Wacker Drive, Chicago, Ill., has recently released a list of replacement seals manufactured by the company and available for replacement service on various units.

### Servicemen all need this book NOW READY FOR MAILING

Our big new free catalog is now ready. In it we list the finest products the service man can use. "Thermo" Fin-in-tube, coils of all kinds, "Boreas" blower units, cascade air-flow pans, the new ice cube maker, and direct expansion coils for air conditioning. Write for it on your letterhead.

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the company has developed many products, among which are: A complete line of flare fittings; two and three way diaphragm packless valves; packed line valves; flanged compressor, angle and evaporator valves; manifolds; check valves; liquid indicators; heat exchangers; strainers; filters; and other items for the refrigeration and air conditioning industry.

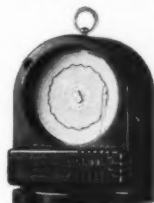
Personal additions and advancements include the promotion of K. M. Newcum from Sales Manager to Vice President in Charge of Sales; appointment of J. A. Alston as Superintendent; Erle W. Kahle, Auditor; H. H. Lamar, Chief Draftsman, and F. K. Jones, Assistant Secretary.

Appointment of Branch Managers and Factory Representatives include: Charles R. Logan, Eastern district; Donald E. Rutishauser (Rudy), Chicago and Northwest; Wm. J. Bagley, St. Louis; Kurt W. Rose, West Coast; Wm. H. Cody, Southwest; E. V. Dunbar, Southeast. Arthur Rocke, President of Rocke International Electric Corp., 100 Varick Street, New York, N. Y., is General Export Manager of the company, states Mr. Forbes.

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• To forestall complaints about the quality of your service work, make an instrument record of every refrigerator job with Practical recording instruments. Such a record proves that you made repairs correctly. This is why so many servicemen say that Practical Recording Thermometers and Operation Recorders are indispensable. Practical instruments are as easy to handle as an alarm clock. They give you 24-hour chart records of temperature and motor-running time. They are proved reliable by 8 years of use in the refrigeration industry. Write for complete information, including terms, specifications, guarantee, and 15 Day Trial Offer. Write today for Instrument Bulletin! Practical Instrument Co., Dept. G, 2717 N. Ashland, Chicago.



Recording Thermometer \$18 with metal carrying case.

USE PRACTICAL INSTRUMENTS

BUY FROM YOUR SUPPLIER

## MAKE SURE PATENT AGREEMENTS ARE SOUND

By H. A. TOULMIN, JR.\*

"COMMERCIAL transactions do not bother the experienced business man," said H. A. Toulmin, Jr., in a recent interview. "But conditions surrounding patents are different. The patent law is a separate branch with a separate set of lawyers, sometimes special courts—and by all means, a separate group of problems.

"When a business man sells commodities and takes the buyer's note, for value received, the transaction is wholly legal. In some states, however, if he takes that same note in payment for a patent, he not only cannot collect the note but, if he discounts it at the bank, he stands an excellent chance of going to jail. In these states 'given for a Patent Right' must appear on the face of the note. If it does not—one state provides

\* Author of the forthcoming book, "Patents and the Public Interest."

a fine of \$500 and a jail sentence of forty days.

"No amount of foresight could have warned the business man of so dismaying a fact. It simply is one of many such facts that must be known. Previous business and general legal experience don't help at all.

"Let's take another angle of the patent law. This could happen to anyone. It actually did happen in this case.

"A manufacturer decided to contract for a patent from an inventor. He received the assignment and immediately put it in his safety deposit box. On the face of the assignment it said the inventor had sold to the manufacturer the entire right, title and interest of the patent.

"Not so long after this the inventor, being hard pressed for funds, sold the same patent over again to another manufacturer. This manufacturer looked up the official records—found no note of any previous transfer—paid his money—received the assignment. Then he did what the first buyer had failed to do—recorded the transfer.

"When the first buyer learned what had happened he naturally tried to have the second sale annulled. But the law said: 'Sorry

—you did not record the assignment within three months according to the law. This makes the second buyer innocent because the government records could not inform him of the previous assignment. This means, under the law, he is the real owner of the patent.'

"Usually the successful executive is an enthusiast. Here is my advice—put aside enthusiasm when dealing with patents. Approach the situation coldly and calmly. It will save excessive lawyer fees.

"Here are a few rules that will help every business man materially in dealing with patents:

"—exercise vigilance. You cannot have too much detailed information concerning patents.

"—make sure the patent classification is defined in detail. It might affect another class of invention, thus become an infringement—with an unexpected legal entanglement—cost of thousands of dollars.

"—include provisions in your patent purchase arrangement that will permit cancellation. This is your protection against later inventions which might render obsolete your present patent purchase.

"—to protect against infringements and

**\* GENERAL SERIES K-15**

**GENERAL  
CONTROLS**  
Refrigerant  
Control



**FULLY  
POWERED  
\* PILOT  
OPERATED  
\* TIGHT  
CLOSING  
\* POSITIVE  
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\* CURRENT  
FAILURE**

**QUIET, DEPENDABLE**

\* General Series K-15 Magnetic Refrigerant Valves are readily installed on air-conditioning or refrigerating equipment. For low and high pressure duty at full ported capacities.

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**REFRIGERATION PARTS**

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**SERVING CANADIAN SERVICEMEN TODAY**

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**Immediate Delivery on  
Replacement Parts for Electric  
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misunderstanding be sure the patent contract specifies who is to prosecute such patent right trespassers—who is to pay the lawsuits—who is to bring them—who is to share in the recoveries.

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## A.S.R.E. TO MEET AT HERSHEY, PA.

THE interesting industrial town of Hershey, Pa., has been chosen as the site for the 26th Spring Meeting of The American Society of Refrigerating Engineers, which will be held May 21, 22 and 23, with the Hotel Hershey as headquarters.

Technical sessions have been arranged for Monday and Tuesday mornings, May 22 and 23, with emphasis on current practical problems in refrigeration and air conditioning.

Papers to be presented include: A Portable Calorimeter for Small Compressors, D. D. Wile, Savage Arms Corporation, Utica, N. Y.; Air Conditioning in Government

Buildings in Washington, Charles A. Peters, U. S. Department of the Interior, Washington, D. C.; Handling of Brewery Fermentation Gas, Leon Buehler, Jr., and Louis DeMarkus, Frick Co., Inc., Waynesboro, Pa.; Methyl Chloride Properties and Tables, E. W. McGovern, R. & H. Chemicals Department, E. I. duPont deNemours & Co., Wilmington, Del.; Design of Truck Bodies for Ice Cream, H. M. Harrington and L. M. S. Cooper, General Electric Co., Erie, Pa.; Overhead Bunkers for Refrigerator Cars, O. C. Walker, Canadian Pacific Railway, Toronto, Canada; Tests on Air Circulation in Precooling, Dr. F. C. Lindvall, California Institute of Technology, Pasadena, Cal.; Bus Air Conditioning, A. J. Mallinckrodt and Lars Hanson, Carrier Corporation, Syracuse, N. Y.

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## NEW CATALOGS AND BULLETINS

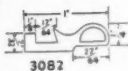
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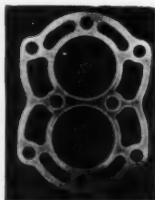


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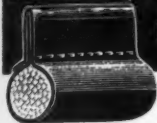
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duce accidents through the use of head and eye protection equipment.

H. CHANNON Co., 133 N. Wacker Drive, Chicago, Ill., have made available their new catalog No. 39, containing 121 closely packed pages, listing all replacement parts and supplies required in the service field. The book is a valuable buyers' guide to the refrigeration engineer or contractor. Write the H. Channon Co. for your copy.

REFRIGERATION SERVICE, INC., 3109 Beverly Blvd., Los Angeles, Calif., have issued their new 1939 catalog of parts and supplies for the service engineer. There are over 200 pages in this new book and it contains many new or improved items over last year's issue.

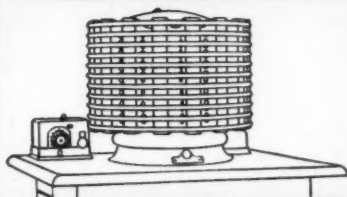
Supplied with the book is a convenient order pad which also provides you with a record of your orders. It is of a convenient size to carry with you as a handy reference or to maintain in your office file.

Copies are obtainable on request.

HENRY V. DICK AND COMPANY, 1513 Camden Road, Charlotte, N. C., has announced their new catalog number SS39.

Much time and work have been spent in preparing this, the most complete catalog available in the air conditioning and refrigeration industry. Only list prices are shown, with a single discount on all items, and the circulation will be limited to those persons or concerns engaged in the refrigeration and air conditioning business. They are also showing their complete line of heating supplies for the first time.

Two new branches have been opened by this company in the last year, one at 703 Main Street, Columbia, S. C., and the other at 125 East Davie Street, Raleigh, N. C. A complete stock is being carried in both of these branches.



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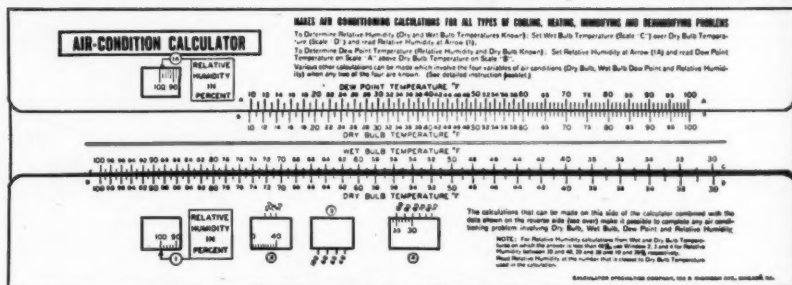
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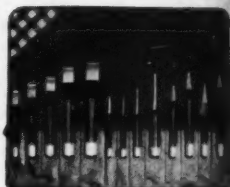
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